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**the ROYAL COMMISSION on the
NORTHERN ENVIRONMENT**

THE FORESTRY, PULP, PAPER AND
ALLIED INDUSTRIES
CHARACTERISTICS AND DEVELOPMENTS

**Funding Program
Report**



ROYAL COMMISSION ON THE NORTHERN ENVIRONMENT

J.E.J. FAHLGREN, COMMISSIONER

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THE FORESTRY, PULP, PAPER AND
ALLIED INDUSTRIES
CHARACTERISTICS AND DEVELOPMENTS

by

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REPORT ON
THE FORESTRY, PULP, PAPER AND ALLIED INDUSTRIES

submitted to
THE ONTARIO ROYAL COMMISSION ON NORTHERN ENVIRONMENT

by
THE CANADIAN PAPERWORKERS UNION

A Resumé

Prompted by the Reed Paper Corporation seeking a lease of some 19,000 square miles of timberland and proposing to build a kraft pulp mill in Northern Ontario, the Ontario Government established a Royal Commission in July 1977 for the purpose of assessing the social, economic and cultural effects of establishing such major enterprises in the north.

The Executive of the Canadian Paperworkers Union decided that this offered a good opportunity not just to comment on the Reed proposal but to undertake a comprehensive study of the forests and the pulp, paper and allied industries with a view to presenting it to the Commission.

The Brief is divided into five parts. Part I discusses the importance of the forest to the pulp, paper and allied industries. Part II examines characteristics and trends of these wood-based industries. Part III proposes a long-term industry plan, a model including long-term goals and strategies. Part IV examines the manpower situation and industrial relations. Part V takes a look at the international trend and developments of pulp and paper products; also the increasing frequency of the computer.

PART I: THE NATURAL ENVIRONMENTAL SYSTEMS AND THE FOREST

The Canadian forests are enormous (said to comprise 17% of the world's growing stock of conifers in 1963) but, nevertheless, those economically accessible at any one time are far from inexhaustible. Slow growth, especially in the northern areas, makes the rotation period long, and hence, the annual yield relatively small. Decades of general forest neglect and the high priority placed on exploiting the timber have further reduced that yield. Only intense forest management over a lengthy period can restore our forests to their potential.

In contrast, the demand for wood continues to accelerate. Advancing technologies have increased the versatility of wood and expanded affluence at home and abroad has created an enormous demand for wood-based products. These divergent trends, rising wood demand and indifferent husbandry, are exerting heavy pressure on the availability and the price of our timber resource.

This relentless demand for wood, its growing scarcity and rising price, make it mandatory that we, as a society, reappraise both how we can improve its yield and how we want to use the resource so as to maximize its importance in terms of employment and income.

As a society, we shall have to decide immediately if we want to meet the rising demand for wood which is likely to require the doubling of our forest capacity over the next 40 years.

If that decision is in the positive, we shall need to establish an ambitious, long-term forestry plan and the doubling of the current forestry investment in real terms.

Apart from the product-based demand for wood, modern life has created or expanded many other demands on the forest resource. These include the

burgeoning demand for recreational space, the demand for parks and wilderness preserves or other aesthetic sites. Fortunately, these demands need not always be mutually exclusive.

Additionally, ecologists give warnings, especially to industrial enterprises, not to perpetuate rash and unnatural acts in the forest which can endanger the delicate balance of nature; caution must be especially exercised in the northern regions where the natural systems are less resilient. Environmentalists warn further that enterprises must be prevented from polluting air and water beyond their capacities to absorb, and that the relative damage will be greater in the north.

Using the information and views provided by various forestry experts, we have formulated a number of suggested policy positions which, when acted upon, would, we believe, assist Canada in meeting its long-term timber needs. For example, the provincial governments, who are the custodians of the public forests, must, upon ascertaining their future needs, develop the kind of policies and provide the staff which will bring forth the needed timber supplies. As part of an effective forest management program, the annual timber requirements of an enterprise should be equated with the annual timber yield. The amount would then be part of the enterprise's timber lease. This would eliminate the waste of enterprises holding surplus timber for future speculation.

We suggest further that in view of the many demands on the forest, the landlord should take responsibility for developing the overall forestry plan and for establishing all or most of the programs required to carry out the plan. Moreover, we suggest that the landlord create a crown corporation who should be given the responsibility of implementing the programs. Tenants should be expected to share in the costs of their implementation.

PART II: THE PULP, PAPER AND ALLIED INDUSTRIES

These industries owe their existence to Canada's most valuable resource -- timber. In 1974,¹ they provided employment to over 131,000 workers whose gross earnings exceeded \$1.5 billion. The value of their shipments amounted to some \$8 billion and over \$4 billion worth of produce was exported, thus being one of the chief earnings sources of foreign exchange. Their share of total employment and value added of manufacturing was 7.4% and 10.5% respectively in 1974.

Pulp and newsprint are world scale industries. In 1975, Canada supplied 34% of the world exports of pulp, 55% of this supplying U.S. needs. Similarly, our share of world export of newsprint amounted to a whopping 70%; 80% of which was taken by the U.S. On the other hand, and as we shall note later, Canada's production of paper products, other than newsprint, is sadly underdeveloped. Our share of world production was only 3% in 1972.

The industries are national in scope, although relatively more of the paper products are manufactured in the central provinces. The pulp and newsprint industries are ancient industries although considerable replacement and remodelling of machines has taken place over time. Being heavily dependent on water and wood, the industries tend to be found in non-urban locations. Both have been instrumental in opening up many isolated areas and regions of our country. Pulp and newsprint production constitutes the major or the only source of employment and income in many of these areas.

Apart from the significant rise in world demand for strong paper (brown), which gave rise to rapid growth of capacity of sulphate pulp in Canada,

¹No representative detail statistics available after 1974. 1976 data available but affected by reduced capacity operation, in part because of a work stoppage.

especially in British Columbia, in the 1960s, the aggregate pulp and paper expansion has been rather modest during the past 25 years.¹ One reason is the slow growth of newsprint which was already a mature industry by the mid-1950s. A second reason is the slowdown during the 1970s in the world per capita real income expansion; this correlates closely with the demand for paper products. Another reason has been the prohibitive cost of constructing new mill capacity in recent years.

An important aspect of the pulp and paper industry is its domination by a few firms. Horizontal and vertical integration are techniques long employed in order to take the edge of competition at home and to cope with the foreign trading giants. The trend is in the direction of creating more complete enterprises -- from wood fibre to a number of end products. The process leads to world scale operations, to increased market power and to greater lobbying strength.

The degree of concentration can be measured statistically. For example, it is estimated that four of the leading firms (of a total of 65 firms) control 35% of all shipments, and that eight of the leading firms control over one-half.

Another characteristic of the paper and allied group is the high degree of foreign ownership -- roughly one-half being so owned and controlled. As might be expected, the United States owns the vast majority of the non-Canadian component.

This shared ownership produces some contrasting effects. On the one hand, the industry's contribution to exports strengthens the balance of payments, hence the dollar. On the other hand, the foreign owned segments also contribute

¹Canadian Pulp and Paper Association (CPPA) August 1979, estimates that over the 20-year period, 1958-78, the growth of all pulp capacity averaged 3.3%; newsprint averaged 2.0%.

to a large outflow of interest and dividend payments which weakens the balance of payments and, so, the Canadian dollar.

Judging by the records, the pulp, paper and allied industries, both in the aggregate and separately, have demonstrated marked instability over the long haul. This is seen in the swings of the value of sales series as well as of after-tax profits; this, in turn, has affected output, employment and income.

As in the case of the Scandinavian counterpart, input costs are relatively high, but the effect of these costs is greater in Canada because of our neglect to modernize and restructure our industries. Moreover, the Scandinavian industries have, until recently, received more public financial assistance for defraying pollution abatement costs.

PART III: INDUSTRY GOALS, OBJECTIVES AND STRATEGIES

The so-called industrial strategy forms, we believe, an indispensable part of a long-term plan that is designed to give an industry direction. The essential parts of such a plan are: a set of major goals, some intermediate objectives, if called for, and a number of appropriate strategies with which to achieve those goals and objectives.

In the above sense, the pulp and paper industry (or any other industry) does not employ strategies because it has not, and does not, as an industry, seek to achieve major long-term goals within a national long-term plan. In a market system, each employer uses strategies to achieve short-term objectives, the priority objective being to maximize profits.

In Part III, we have outlined a long-term plan which we believe would be appropriate for the pulp and paper industry. It is a simple model, and the goals and strategies presented are, obviously, not exhaustive. It offers, however,

a useful illustration of industry planning, to which the relevant public authorities and the pulp and paper industry must soon give serious consideration.

Suggested long-term goals pertaining to the pulp, paper and allied industries, including converters:

- a) to maximize employment and growth of income;
- b) to achieve the most profitable use of Canada's timber resource;
- c) to achieve growth of productivity; and to reduce the recurring instability that plagues so many parts of this industry group.

Select strategies for achieving the suggested goals:

- a) by stabilizing the capacity of pulp and newsprint;
- b) by maximizing employment and income in the "other" paper industries, including the converters;
- c) by stabilizing tariffs;
- d) by public and private investment;
- e) by consolidating marketing and sales;
- f) by much greater emphasis on and co-ordination of research and development.

The ensuing statistics give an indelible picture of why our paper industries should have operated under such a long-term plan, and the vital necessity to do so now. While we have drifted along the primary products path, our international competitors show the reverse -- maximizing the high value-added products while minimizing the primary.

Enriched Products as a
Percentage of Total¹

<u>Country</u>	<u>Percentage</u>
Canada	13.7
USA	51.3
EEC	74.4
Scandinavia	30.6
Japan	52.3
USSR	42.1
"Others"	58.0

The evidence is glaring. Our achievement, deplorable. There is little doubt that our competitors have pursued goals and applied conscious strategies that would enable them to concentrate their production of high-priced products, that is, the high value-added products. The statistical picture reveals the results, at least in part, of one country pursuing short-term gains and others seeking long-term achievements.

Our overall strategy for changing the mix calls for a moratorium on capacity expansion of newsprint and pulp, except by way of modernization while at the same time doubling the aggregate capacity of the remaining paper sectors. Assuming a stable capacity of pulps and newsprint at the 1980 level of 39 million metric tons and a doubling of the high value-added from 6.2 to 12.4 million metric tons, the strategic ratio would advance to about 28%, a more respectable percentage, and one to build on.

An important objective of this strategy is to force other pulp and paper producers to shift more to the primary products and away from the high

¹Enriched equated with all products except all pulps and newsprint.

priced goods. To accomplish this would mean a substantial shift in our investment into the other paper products, facilities that are now lamentably inefficient. Creating an efficient industry of enriched product producers out of this fractured group will require a great deal of public money which, as a precondition, must insist on a long-term industry plan.

Among the other strategies we suggest for upping the efficiency of the whole industry, are marketing and sales and research and development. Marketing and sales is a service function that concerns itself with many activities: market research, product planning, standards, pricing, credit arrangements, advertising, invoicing, bill collection -- and running sales outlets. By and large the function is developed and carried out by the individual firm. There is, therefore, a great deal of overlapping and waste. We suggest that marketing and sales for the whole industry ought to be brought under one roof, and that this would make the function vastly more effective in terms of costs, especially by carrying more sales clout in foreign markets.

The model we have in mind is Finpap (Finnish Paper Mills Association). Among many, Finland has used this strategy vigorously and successfully. Finpap is currently said to be the world's largest export organization, responsible for some three-quarters of the total Finnish marketing and sales of paper products. The goal is said to be the single agency.

The problems involved would be many and difficult, but not insurmountable. The rewards would appear to be substantial. In any event, some central institutions exist: the Canadian Pulp and Paper Association, the Canadian Pulp and Paper Research Institute, etc.

Another strategy examined is research and development. This one can be a most potent stimulus for advancing and maintaining a high level of productivity

and efficiency in an industry. When neglected, products become expensive and markets are lost to those whose investment in research and development remains high and skilfully planned.

Judging by the records, the pulp, paper and paper products industries have, apparently, not put a high value on this kind of investment. Their investment in research and development, in terms of value of sales, has remained well below 1% for many years. They also have a poorer record than research and development in total manufacturing, which is also said to be well below what is required to keep Canadian industries competitive in export markets and with imports. That, after all, is the only measuring rod. If our competitors inject 2% of sales or GNP and we only 1%, we are guaranteed market problems.

In relation to our competitors, Canada was late in recognizing the importance of providing a significant public incentive for the research and development in industry. That now has come. The previous government set an incentive target of 1.5% of GNP; the present one has upped it to 2.5%. In the meantime, it is running below 1%.

When we discussed the investment strategy, which we partially dealt with in a) and b) above, we noted the rising amount of public financial participation in the pulp and paper industry, the sharing of costs of pollution abatement, financial assistance to research and development, and general financial assistance to modernize.

We make the observations that, while we support in principle governments extending financial assistance to industry, provisions must be made, as a matter of course, to secure the income of any worker who is displaced as a result of the investments.

PART IV: MANPOWER AND INDUSTRIAL RELATIONS

Based on the assumption that no additional pulp and newsprint mills should be constructed in the next decade or so and assuming continued slow economic growth, we predict that the demand for additional workers by the pulp and paper products industries is likely to be modest, possibly in the neighbourhood of 10,000 to 15,000 in the decade 1980-90. On the other hand, total demand, which includes replacement for normal attrition and voluntary leavers, is likely to be moderately high, especially in the more isolated labour markets.

The drift out of the remote to urban areas, especially by workers with readily transferrable skills, is likely to increase. There are many reasons for this drift. Advertising and mass media have taught people to prefer variety and to be able to choose among many options. They find these in urban, but not in the remote areas. Other factors may play a role -- such as lack of job security, comparable wages, working conditions, etc.

On the supply side, we foresee no dramatic shrinkage of the one million unemployed. However, there will be some significant demographic changes during the 1980s, among them a marked decline in the 14 to 25 year-old.

Nevertheless, we do not foresee any major manpower shortages in the pulp and paper industries, at least not in the urban centers. Shortages of skilled manpower could increase in the remote areas. That will depend a great deal, of course, on the ability of employers and the union to attain the kind of wages and to develop the kind of social programs that will attract and retain skilled workers.

We suggest that a comprehensive, though flexible, apprenticeship program and other appropriate short-term training programs are indispensable any time and may be even more so over the next several years.

In any event, employers, in consultation with the union, need to review and strengthen their manpower and social policies because workers, as people, are becoming more independent and more mobile; and they regard their quality of life component as being more important. In remote areas, firms ought to give high priority to social programs. Among other things, these areas are suitable for developing various fitness and recreational programs. As a general principle, it is incumbent on an employer to demonstrate that he is as concerned with the working people as he is with the company gadgets and the shareholders.

We demonstrate that industrial relations -- which include the right to organize the union of one's choice, the right to collective bargaining, and to strike if issues are unresolved, and to have grievances processed through established machinery -- are complex and therefore not always peaceful. We note that work stoppages have not played a major role in the history of collective bargaining in the pulp and paper industries. On the other hand, we find that industrial relations in Canadian industries generally has had a stormy history compared to the European experience. We offer some reasons why the Canadian situation is worse and present a number of experimental programs which have been used to achieve and maintain good relations in industry.

Many factors contribute to strained relations in industry. We would submit that one of the most pervasive of these is that, while in the European countries unions have been fully accepted as an integral part of the democratic fabric, the Canadian unions have not. In consequence, an uncertain truce has prevailed which has encouraged some firms either to preclude a union forming or taking steps to cause its demise.

Another factor may be their broad-based approach to collective bargaining. Obviously, the national method eliminates the multitude of wage negotiations.

Some European countries have managed to reduce some of the friction points in industry by experimenting with new programs. Aside from the broadly-based bargaining, the following examples are some of the strategies employed:

First, at the mill level, management has instituted a system of regularly informing the workforce what is happening to the firm's output, sales, profits, etc. This practice is not unknown in Canada, but it is less fully developed.

Second, special emphasis is placed on good communication and co-operation in industry. Irritations and misunderstandings can and do arise at the workplace and these, if not quickly resolved, will sour relations. In Europe, the Works Council, a legally based institution, is responsible for clearing the deck of such problems. In Canada, the Labour Management Cooperation Committee, a voluntary organization, is supposed to provide a similar service. Its successes have been very intermittent.

Third, an attempt has been made to restore meaning to work by stripping away existing monotony and ennui from industrial work. Some success in this has been recorded by organizing workers into small groups of six or eight, and allowing them full responsibility for particular work operations. This technique for improving the quality of work life has made little headway in Canada.

We recognize that there are new elements in the modern work situation which would seem to require new approaches, auxiliary to collective bargaining.

The evidence suggests that some of these approaches tested can lower the tension level found in industry.

While we appreciate this possibility and potential, and would be interested in exploring with management how various relationships might be improved upon, the evidence of management's routine relations with its workers and its periodic relations with the CPU is not very encouraging; it does not demonstrate that management in this industry is really interested in establishing more mature and stable relationships.

PART V: THE PULP, PAPER AND ALLIED INDUSTRIES - LONG TERM PROGNoses AND DEVELOPMENTS

Forecasting remains an imprecise art-science; but predictions can now be churned out rapidly, and just as rapidly revised, their reliability still rests on assumptions about many factors, some of which are quite volatile.

Since the early 1970s, economic forecasts, both national and global, have become increasingly more pessimistic. Consequently, recalling that the demand for paper products correlates closely with economic growth, especially changes in per capita income, the prognosis showing growth of production and consumption of paper products has also become less optimistic, especially in the western world.

The most optimistic global prognosis suggests that GNP may increase by 4.5% in the years ending 1990, with the western growth rate somewhat above 3%.

The Federal Department of Industry, Trade and Commerce expects the Canadian GNP (in real terms) to grow at an annual rate of 2.2% during the 1980-90 decade. Its prediction for the U.S. for the same decade is 2.5%.

Assuming no catastrophic oil crises and the normal amount of revolutions, these growth estimates may not be far off the mark. We must recall, however, how quickly the long-term relationship between economic growth and paper consumption can change. In our case, the sharp decline in the exchange value of our dollar has boosted demand for pulp and paper in foreign markets in the past two years and, consequently, created a prosperous industry.

Differential growth in the regions of the world, increased competitive developments and raw material endowment are, in the long run, expected to cause shifts in the regions' composition of capacity and product. Certainly, changes in the following statistics are predictable. For example, North America and Europe which comprise 21% of the world's forest, 25% of the population, produce 77% of the world's products. In contrast, Latin America and Asia which possess 50% of the forest and 70% of the population, contribute only 10%, as yet, to the total production. The shares of the African countries, which are new pulp and paper producers, are 15%, 10% and 1.0%, respectively.

As might be expected, the dominance held by North America and Europe is weakening as new pulp developments in Africa and Latin America, especially in Brazil, emerge; increasing newsprint production from bagasse is also contributing. The shift in favour of the developing world, although still from a low base, is expected to accelerate for some years because of two limiting factors operating in the North American and European situation: the growing scarcity of timber and the high costs of constructing new capacity.

High capital costs are a limiting factor everywhere at present, but the factor may affect North America and Europe somewhat more. Productive and forest capacities are said to be roughly in balance in Europe; a similar

situation obtains in North America as well, although the potential for increasing the forest capacity is greater, given enlightened forest management policies.

A further comment on the capital factor as it affects the pulp and paper industry -- it was predicted some years ago that public financial participation in the industry would increase and become a permanent feature in the future (Risto Ecklund). This has come to pass in Canada also; in the case of pollution abatement, assistance to modernize, and to stimulate research and development. Our comments on this are that we agree in principle but that we are disappointed that no pre-conditions appear to be attached to the use of the taxpayers' money. For example, the investment should indicate the public's equity position in industry; the public authorities should have insisted that a comprehensive long-term plan for the industry should have been jointly created. Finally, we have insisted that employment and/or income security must be guaranteed to the workers affected.

No doubt because of the increasing pressures on wood supplies, various technologies are being developed to conserve the scarce supply. For example, more of the tree is being utilized; recycling of waste paper is said to make up 25% of all wood fibre used; less pulp is being used per ton of output and an increasing amount of lightweight newsprint is being produced.

In the case of new developments, one report points out that apart from the twinwire, the process of papermaking has remained basically the same since its inception. Successive advances in technology have been mainly directed at increasing the size and speed of the basic machine while also improving the ancillary operations. In more recent times, and despite the high cost of capital and equipment, sharply rising variable costs and keen competition internationally have pressured firms into purchasing increasingly more sophisticated hardware in order to survive. The ultimate road, it would

appear, is in the direction of the computer and automation.

The computer is, apparently, a versatile gadget. It can help improve the quality of paper, reduce the amount of wood fibre used per ton of paper, save energy, displace labour and even assume many of the managerial functions. One of the foremost illustrations of this trend is the recently completed Varkaus Project in Finland which is a totally integrated forest industry complex and, possibly, the nearest so far to being fully automated.

The workers and their representatives have not made technological changes a major issue in these industries. We have accepted, reluctantly, that the acquisition of new models is one strategy, though not the only one, for keeping the industries competitive. Introducing the computer, however, with a view to ultimately automating the industries, confronts the workers with radically different problems. The transformation from mechanical to electrical technology strips the workers of their traditional skills; the magnitude of workers displaced also is likely to be considerably greater than the case of traditional technological changes.

In consequence, the move to automation will require longer lead time and careful long-term planning will become imperative, including how best to utilize and protect the workforce. Employment protection programs and income protection programs will have to be agreed upon well in advance of the technical action. The planning and implementation of these programs ought to be carried out jointly by union and management, and with the assistance of the federal and provincial manpower and technological change agencies when so requested.

TABLE OF CONTENTS

	<u>Page</u>
PART I <u>THE FORESTRY SECTOR</u>	1
Introduction - Proposed Examination	1
The Natural Environmental Systems and the Forestry Sector	4
Canada's Forest Resource	7
The Ontario Forest Landlord	11
Forestry Roads	21
Landlord-Tenant Relationships	24
License and Tenure	24
Forest Management	26
Timber Revenues	27
World Forest Resources	30
Concluding Observations	35
 PART II <u>THE PAPER AND ALLIED INDUSTRIES</u>	 38
The National Importance of Canada's Wood-based Industries	38
THE PAPER AND ALLIED INDUSTRIES	40
The Pulp and Paper Industry	42
The Location	43
Capital Expenditure Expansion	48
Pulp and Paper Expansion and Exports	51
Factors Affecting Consumption of Paper and Paperboard	61
World Production and Exports	63
INDUSTRY CHARACTERISTICS	73
The Foreign Ownership Function	73
National Picture	78
Industry Concentration	80
Industry Concentration - Comparison 1968, 1972	81
Productivity Trends	87
Various Cost Characteristics	89
Comparative Wood Costs, Location and Time	89
Comparative Manufacturing Costs	92
Pollution Abatement Costs	97
 PART III <u>INDUSTRY GOALS, OBJECTIVES AND STRATEGIES</u>	 102
Global Goals and Strategies - A Simplified Model	104
Reasons for Strategies a) and b)	106
Investment Strategy	113
Tariff Protection	115
The Marketing and Sales Strategy	117
The Research and Development Strategy	119

PART IV	<u>MANPOWER AND INDUSTRIAL RELATIONS</u>	124
	Manpower	124
	Industrial Relations	131
PART V	<u>THE PULP, PAPER AND PAPERBOARD INDUSTRIES - LONG-TERM PROGNOSES AND DEVELOPMENTS</u>	143
	The Industry and the Computer	161
APPENDIX 1	.....	167
APPENDIX 2	.....	168
APPENDIX 3	.....	169
APPENDIX 4	.....	170
APPENDIX 5	.....	171
BIBLIOGRAPHY	.....	172

PART I
THE FORESTRY SECTOR

Introduction - Proposed Examination

The Canadian Paperworkers Union, representing over 58,000 employees in the pulp, paper and converting industry and the woodlands industry, appreciates the opportunity to contribute to the Ontario Royal Commission on the Northern Environment.

1. The decision of the Ontario Government to appoint a Royal Commission to determine various effects that a major enterprise is likely to have on the physical environment and on the people of a community, before its construction, is a logical and sensible step, long overdue. It breaks radically with a long tradition which allowed such enterprises to proceed unimpeded without sufficient consideration of the community as a whole, and based on least cost to themselves. The side effects of this unilateral approach included a period of uncertainty and social stress in the site community, followed by improvident use of raw material resources and, sometimes, serious damage to the environmental systems.

2. The timing of the Inquiry is opportune. Experts on various environmental matters, natural resources, as well as social scientists, have demonstrated that we must concern ourselves a great deal more with other objectives in addition to the economic one. Industrial expansion, employment, etc., must continue to receive a high priority, but not at any cost. The mounting evidence of a deteriorating natural environment is raising concern and even apprehension about how much pollution we can tolerate and apprehension about the rapid loss of our aesthetic assets. Similarly, while the pursuit of

material things will continue to consume much of our energy and ingenuity, it is apparent that social and cultural matters will be given more weight in this equation.

3. Among other things, the appointed Commission will seek to discover a measure of accommodation among these competing objectives. A final goal of the Commission will be to develop a formula, approach or method which, when applied to a proposal of a major enterprise, will give adequate weight to all relevant factors. The approach will, no doubt, be structured so as to produce trade-offs and the weight of each will depend to a certain extent on the opinions of experts and others who are expected to participate.

4. While not stated explicitly in the terms of reference, we assume that the government still attaches a high priority to industrial expansion. The Commission is assigned the role of finding and establishing a broader-based policy approach for deciding whether it is in the public's interest for an enterprise to establish an operation; and if positive, how to proceed.

5. The interest of the Canadian Paperworkers Union in this study is limited to the pulp, paper and allied industries, and their raw material base. The original proposal by Reed Paper to establish a major enterprise in northern Ontario offered the opportunity for studying these industries.

6. Our study is not limited to a single enterprise. We want to examine various aspects, arrangements and policies, or absence thereof, of the timber resource; also various aspects, factors and policies that over the long haul have given these wood-based industries such a strong primary base but a very weak secondary one.

7. We do not aim at finding solutions to problems encountered, or to offer definitive answers. That would be far too ambitious on our part. The following report will, nevertheless, provide a number of policy options and

suggestions directed at long-term improvements.

8. We assume that many of the characteristics of these industries have evolved over time in a more or less undirected way. Insufficient attention may have been given to the development of more effective public policies and too little attention given to the public policies that have shaped these same industries in the countries with whom Canada must compete.

9. We propose to examine in some detail the policies and arrangements developed and employed by the Ontario government, especially those designed for managing and regulating Ontario's forest and timber crop.

10. We want to examine why the primary base of the producing group has remained so strong and unaltered over the long term. We shall suggest ways of gradually changing the export mix, and so more effectively utilize our timber resource.

11. We shall examine the recently enriched public policy that provides additional financial assistance to these industries and propose how that public policy could be applied so as to be more effective.

12. We propose to examine various relationships existing between management in the industry group and their workers and representatives with a view to improving those relations.

13. We shall examine the likely development of international trade in pulp and paper, and also look at the likely further intrusion of the computer.

14. The 58,000 workers whom we represent are deeply committed to this industry. In consequence, we are of the view that while our traditional role of regular wage negotiation must remain the principal one, we would agree to explore with management the possibility of enlarging that role.

15. Finally, any policies, private and public, that affect the stability and security of employment and income in this industry group are of vital concern to the workers. They have a large stake in the industry -- their and their families' livelihood.

The Natural Environmental Systems and the Forestry Sector

Experts have written and spoken extensively on all aspects of the environment in recent years. Some of these, and others, will present their findings and views to this Commission. In view of this, and although we appreciate the vital role environment plays in our lives, we shall deal with it rather summarily. Nevertheless, both here and in subsequent discussions, we shall make our position clear on the environmental issue. We view the relation between the environment and the forestry industries as an important practical matter.

In their pure form, the forest industry sector and the natural systems are inimical to each other. The forestry sector is most profitable when man can ignore the systems and the systems are healthiest when not interfered with.

However, given the present technology, the pristine state of nature cannot be maintained in an industrial society and because we are dependent on both relatively healthy systems and the proceeds from industry, we have gradually learned to compromise and to minimize our actions. Growth of knowledge, increased understanding, new technologies, better planning and control can now significantly reduce our adverse effects on these natural systems.

Unimpeded, or if not overloaded, the natural systems play many constructive roles, among them their ability to facilitate forest growth, regulate the flow of oxygen and carbon dioxide between forests and air and hydrology of the land. We have the ability and the need to upset these balances, but also the intelligence and ability to minimize the disturbances.

These natural systems show marked variability with respect to topography, especially with respect to climatic conditions. In the southern regions, the systems facilitate and accelerate forest growth; they also exhibit remarkable assimilative powers when we disturb them. The farther north one proceeds, the slower is forest growth and the weaker is the assimilative power of nature. In response to this fact of life, economic activities must be appropriately adjusted to take these imperatives into consideration.

That climatic factor becomes highly important in making determinations in the north about harvesting timber, building roads, planting trees, using chemicals or constructing industrial complexes. The farther north we operate, the more drastic is the imprint of our actions likely to be and the greater the demands on us to minimize that imprint.

The evidence is overwhelming that modern productive technologies (mechanical methods of management, use of chemicals) and other inexorable pressures to keep competitive have an accumulative adverse effect on the natural systems. On the other hand, pollution abatement and control technologies have now advanced to a stage at which the hazards of effluents and emissions from certain industrial processes, such as chemical pulping, can in most instances be eliminated in new installations or reduced to tolerable levels in the old. Good planning and good management can minimize hazards associated with forest activities.

It is clear that in the matter of debasing the environment, the record of some forestry firms is exceedingly bad. Extensively polluted water systems testify to that. The resolution would appear to be partly technical, but mostly it is one of enormous costs which are relatively greater in the case of the older sulphite mills.

While we intend to examine pollution abatement costs at a later stage, we want at this time to raise the question of who should pay for them. This, we feel, is a legitimate question because how that question is ultimately resolved will have much to do with how effectively we shall be able to preserve and promote employment and income in the forest industries.

Theoretically, the question of who should pay seems to boil down to two contrasting views. The producer may claim that the use of the environment to absorb waste products is a right that all firms must of necessity enjoy and, therefore, whoever wants air and water to be clean should pay the price. The consumer, on the other hand, may argue that the use of the environment as a source of clean inputs of air and water takes precedence over the use of it as a sink, and that whoever makes the environment dirty should be the one to pay.

So far, society has tended to side with the consumer -- that the cost of cleaning up and keeping the natural systems in good operative order should fall on those capable of doing the damage.

In view of the very high cost involved in reducing the past and present damages contributed to in varying degrees by the forestry industries, we support in principle the recently announced public policy to assist in the abatement costs.

All provinces and the federal government, as well as most western nations, have now introduced environmental protection Acts, with attendant standards. These Acts suggest a strong concern for protecting the environment and firm public support. Unquestionably, while the attainment of safe

environmental standards is not only desirable but essential, it will also entail immense costs which, by and large, will be borne by the consumer in the form of higher prices. That would seem fair enough. However, we are also aware that the cost of environmental abatement would, in the absence of public assistance, prove particularly onerous for older operations.

We have in mind a situation in which the owner of an older plant deems the cost of attaining the prescribed pollution standards excessive or even beyond his financial capability and so decides to close the mill. The social and economic consequences of such an event to employees and to a community, especially in the north, can be enormous and tragic.

There is also the important matter of our foreign competitors receiving abatement assistance as a matter of public policy. We shall comment further on this point when we examine the competitive position of the Canadian pulp and paper industry.

Canada's Forest Resource

Canada is very fortunate to be endowed with an extensive forest resource. It is without doubt our most valuable renewable resource and forms the backbone of several important industries, among them the wood industries and the pulp and paper and allied industries.¹

¹These two groups provide some 240,000 jobs and \$5.7 billion value added (Statistics Canada Cat. 31-200 Annual, 1974).

In terms of acreage, the productive forest lands are more than twice that said to be allocated to farm production. We boast that our farm sector is the major breadbasket of the world; if so, the timber resource must surely be the wood-box of the world.

The total forest area is estimated at some 800 million acres; about one-half of this is now allocated to wood production. This immense timberland resource is more evenly distributed than agricultural land. Measured in terms of volume estimates (cu. ft.) B.C. has 40% of the total productive forest area; the Prairies, 13%; Ontario, 22%; Quebec, 19%; and the Atlantic Provinces, 6% (New Brunswick claims half of this).¹

It is interesting to note that while the farm and forest resources exhibit many different characteristics, for example in the matter of ownership, periodicity and variety of crops, some features are remarkably similar. In their different ways, both produce annual crops that exceed home consumption. Both produce crops that can be processed into a variety of products. Both are susceptible to climatic conditions and to environmental pests. To attain an economically productive level, both must be managed skillfully and must rely on the latest technologies and scientific management methods respecting raising, harvesting and marketing of the crops.

After a century or more of use and abuse, one important aspect of the timber resource remains intact -- most of it, roughly 85% of the total resource, still belongs to the people of Canada. The question has been debated from time to time -- would we be better off if this valuable resource was turned over to private developers?

¹See Tables 1 and 2, pp. 30 and 31.

It is encouraging to note that in most instances, those who have advised the governments on this issue have generally opted for Canada to retain the resource as public property.

When examining where the ownership function rests in various countries, it is notable, for example, that in the southern United States and northern Europe, where we find our keenest competitors of forest products, large portions of the timberland are held privately.¹ One reason for that in northern Europe is anchored in history and stems from the shortage of farm land for cultivation. To be viable, a farm had to be made up of a small plot of land and a large timber tract. Both had to contribute to the farmer's livelihood and, consequently, he had to practise good husbandry on both.

In purely economic terms, it could be argued that a private owner in this country, moved by self-interest, could develop this resource more efficiently than a public authority. Ingenious taxation, or other means, would no doubt enable a government to extract as much revenue from a private sector as it is able to do under present arrangements.

Notwithstanding this conjecture, the Canadian Paperworkers Union shares with many others the satisfaction of knowing that this vast and valuable resource remains mainly in the public domain.

We support public ownership of the forests for a number of reasons. No doubt a private arrangement would inevitably lead to speculative acquisition

¹In the southern U.S., 91% of the commercial forest lands are held privately. Large tracts of land are owned by the forest industries. (Source: Investment Outlook and Related Federal Policies, 1976-1985. Stanford Research Institute, 1977). Private holdings elsewhere: Europe, 53%; Oceania, 75%; South America, 44%. (Source: Facts About Swedish Forestry and Wood Industry, 1977)

of the resource and there is ample evidence elsewhere that when such speculation in land is allowed, the overall adverse effects exceed benefits. Equally important, it is becoming increasingly evident that the forest resource is not exclusively an economic one. Many other valid claims are being made on it, such as environmental protection and the task of meeting social and cultural needs. These demands are increasing, many are in conflict, sensitive and almost intractable. The situation calls for compromises and suitable trade-offs and we feel strongly that a public landlord rather than a private one is more likely to find the appropriate accommodations. Moreover, although goals and strategies are still missing, public ownership affords a government the opportunity to manage the resource globally according to a long-range plan, and thereby also guide industrial expansion and other developments.

Essentially, what we have in Canada is an immense publicly-owned renewable resource that is being administered by ten landlords.¹ Most of the harvesting of the timber crop is done by tenants, or licensees who convert the fibre crops into various products. Like any other tenant-landlord arrangements, the licensee must pay for his privileges.

A great deal has been written about the misuse of the forests and timber resources both in this country and elsewhere. We shall omit recalling the timber baron period. For the present, we are principally interested in the landlord's seemingly changing perception about his estate. Until very recently, his policy was simple and clear -- exploit and administer. Various developments and pressures from without, and possibly from within, have caused him to

¹Federal holdings, apart from parklands, are very small.

reconsider that policy. The fear of running short of timber may have contributed to a critical review of the status quo. In any case, the new thinking is that the estate will have to be managed, not just administered. Various managerial functions have been added from time to time but so far they have not fitted into a global plan or policy.

Management of the total estate (province) will require a global long-term plan with suitable goals and objectives and appropriate strategies. This, in turn, will require suitable, comprehensive managerial policies and programs and, depending on the size of the global target, additional staff and a larger budget in order to implement the long-term plan. We are keenly interested in this development because of its importance and relevance to the long-term employment development of the pulp, paper and allied industries.

The Ontario Forest Landlord

We shall examine the recent move to long-term planning in greater detail, using the Ontario landlord as a prototype.

While there are indications that other provinces may be facing and moving in the direction of long-term planning and forest management,¹ recent

¹The Inquiry Commission on the Pulp and Paper Industry in New Brunswick (Report 1972) would not support this claim. Among several references to the lack of a forestry policy, one such reference says: "The cynic would suggest, not without some justification, that as regards forestry policy, governments have appointed Commissions as a substitute for action." (p. 31.)

A Quebec report also points to confusion in the forestry policy in that province. "Mémoire de la Fraternité Internationale des Travailleurs de l'Industrie des Pâtes et Papiers à la Commission Parlementaire des Terres et Forêts, 1972." (A recent report, 1978, issued by the Quebec Department of Lands and Forests, offers a number of longer term proposals purporting to modernize the newsprint industry, especially; it also includes some new forest policies and reference to the strengthening of forest management.)

On the other hand, the Royal Commission on Timber and Forest Policy, B.C., 1976, refers several times to long-term planning and forest management, for

publications in Ontario² suggest that on paper at least the Ontario landlord may be further along than some of his counterparts.

There must be, of course, sound and valid reasons for undertaking such a major task. Large immediate costs are involved. A long-range forecast is called for. The relevant Ontario report, dealing with "Policy Options", provides us with estimates of both. Among the various support items, the report shows, for example, the importance of the wood-based industries to the province, especially to northern Ontario.

Ontario has 22% of Canada's marketable timber (17% of the conifers); it has 22% of the wood pulp production, 26% of the paper products and 28% of total employment in the forest industry (about 78,000). It is also notable that more paper processing is done in Ontario than elsewhere in Canada.

About 90% of Ontario's marketable timber is in the north, but this provides only 40% of the province's forest employment. About 61% of all manufacturing employment in the northwest is wood based; 31% in the northeast.

example: "Forest management policy for the future should be directed toward two related objectives: protection and enhancement of the capacity of forests to produce their potential within that framework the regulation and harvesting to produce maximum long term economic and social benefits from the timber resources." (Vol. 1, p. 235)

²Forestry Production, Policy Options for Ontario, Ministry of Natural Resources (Forestry Division), Reprint, August 1974; and Forest Management in Ontario, 1976, by K.A. Armson, R.P.F.

However, the weightiest factor suggested by the report¹ in support of a more vigorous long-term forest program is that, while the landlord's present effort is yielding less than six million cunits² annually, barely adequate for current needs, the Ontario forest is said to be capable of producing somewhere between 16 and 20 million cunits annually.³

That suggests that if the Ontario landlord wants to take advantage of the estimated future demand for wood products, he will have to take his management duties a great deal more seriously.

Having surveyed various estimates purporting to show world demand for paper products in the future, the author of Policy Options, relying mostly on extrapolation of past trends of wood used in the province, estimates that by 2020, roughly 12 million cunits will be required, or about twice the present annual harvest.

An extended forecast such as this, whether one employs naive or sophisticated techniques, is very hazardous. It does not, however, nullify the value of the exercise. One might even use a simpler technique: By assuming, for example, that over the long haul the volume demand for paper products will continue to follow the real growth of the GNP. Thus, if real output in Canada and the countries that purchase our wood products averaged a modest 2% annually from 1980 until 2020, that output would roughly double⁴ and so would the demand

¹Forest Production, Policy Options, p. 21.

²Cunit, 100 cubic feet. One cord, 128 cubic feet.

³Provided by two different experts.

⁴Actually double in 35 years, compounded.

for the wood products and consequently the requirements for wood supplies. If Ontario held its share of that expansion, the existing harvest yield also would have to double. In any case, unless the world demand-supply situation for paper products alters markedly, a much more responsible effort is called for by the Ontario landlord, provided he wants to take advantage of future market opportunities.

Having established an estimated future wood requirement for 2020, the author logically offers the landlord a number of policy options -- and what certain targets will cost and achieve.

The second option (the first option assumes no expenditures) shows that if the present expenditure program of \$8.8 million were continued (constant dollar value), it would produce an annual sustained yield of four million cunits or about 70% of the present cut.¹

The third option suggests that if the landlord wants to maintain the present cut of some six million cunits, he must boost the forest budget to about \$15 million per year.

The fourth option advises the landlord that if he is to aim for a sustained annual yield of 12 million cunits, he will have to increase the regeneration, silviculture and management programs substantially and raise the forestry budget to about \$30 million annually.

The fifth option simply suggests that, based on available forest areas and existing techniques, the Ontario forest could, when intensively managed, yield an annual harvest of 16 million cunits by the target date. To produce that amount would, however, require an estimated expenditure of some \$44 million annually (in 1972 dollars).

¹Policy Options for Ontario. We assume the "present expenditure level" refers to 1972.

Whatever the merit of these observations, the author is no doubt voicing the concern of many Ontario forestry experts when he says that "we are rapidly approaching the limit of economical harvesting and in some instances shortages already exist. It is obvious that to survive, Ontario's forest industry will become increasingly more dependent on man-made forests."¹ Another expert voices a similar concern: "Given a continuance of the current level of regeneration there is a distinct potential for timber shortages in the 1980's."²

Given a long-term target, what should be the main ingredients of a management policy which the landlord needs to reach his target objective? According to some experts,³ the following are said to be indispensable steps for such planning:

- 1) A global inventory -- showing sub-divisions according to economic, social and environmental criteria;
- 2) These areas to be designated as:
 - a) multiple use timber areas
 - b) currently commercially unsuitable
 - c) wilderness preserve;
- 3) The global inventory area a) must have a sound statistical base
 - showing kind and amount of trees, age, etc.
 - sound technique for renewing data
 - provide for an efficient retrieval system
 - be flexible so as to provide for adjustments in time of policy changes;

¹Policy Options, pp. 33-34.

²Report of the Timber Revenue Task Force, October 1975, p. 26.

³Forest Management in Ontario 1976, and Timber Rights and Forest Policy 1976, B.C. Royal Commission.

- 4) Multiple use areas should be so designated as to allow harvesting to respond to market changes and technological changes;
- 5) Inventory should show network of access roads;
- 6) Area a) should be subdivided into units allowing for productive management practices.
- 7) A management team of sufficient size in order to ensure that the required management policies can be implemented;
- 8) Each team must have the appropriate composition of professional, technical and other personnel who can carry out all the required functions;
- 9) The overall budget must be of sufficient size to enable the teams to practice productive management and so bring forth adequate supplies at minimum cost.

No renewable resource, possibly apart from fish, lends itself more ideally to long-range planning than our forestry resource; no resource is now in greater need of such planning. It would appear rather elementary that in view of its importance to the country and because of its very long rotation period (50 years or more), sound long-term planning and intense forestry management might have been expected decades ago. Such, unfortunately, has not been the case.

There are superficial reasons why this foresight was late in arriving. All the forest landlords and many others have suffered from the illusion of super-abundance of timber. Moreover, revenues from the forest expanded with volume exploited; so, why rock the boat?

Warnings were sounded from time to time by professional foresters and

even by politicians,¹ but that aroused little interest and certainly no action. A long-term plan and a forestry management program, if thought of at all, implied investing in the distant future. That tends to run counter to political reality. A government operates within a short rotation period, and consequently an investment offering a short-term payoff will no doubt receive priority over one promising a long-term yield. One must accept the inevitable that few of our present politicians, and very few others for that matter, will be present to enjoy the fruits of any silviculture investment of today.

Nevertheless, the whole purpose of investing adequate funds in the forest is to guarantee sufficient economic supplies to the wood-based industries, a group that constitutes by far the largest employment and income generating source of the country.²

Ontario conceived its fledgling forest management initiative in 1962. Understandably, any sudden and complete departure from the traditional to the new system was not to be expected. Reorganization had to take place and new policies and programs devised. Staff had to be assembled; these had to learn to adapt their skills to complex new activities, without which management policies could not be implemented.

¹Sir John A. MacDonald voiced his warnings as early as 1871: "We are recklessly destroying the timber of Canada, and there is scarcely a possibility of replacing it." Fifty years of reforestation in Ontario, report by E.J. Zavitz.

²Wood industries, furniture and fixtures, pulp and allied, when taken as a group constitute 16% of total manufacturing employment and 18% of value added. Manufacturing industries in Canada 1974, Statistics Canada.

Forest Management in Ontario 1976. For definitions of Forest Management and Silviculture, see Appendix I, p.167.

The gestation period is now (1980) some eighteen years and, while the new program is said to have expanded considerably, it is apparently still far from being mature or even adequate. What is worrisome about the Ontario program is its lack of dimension, its apparent lack of internal consistency and the paucity of basic tools so essential for making forest management efficient and productive.

Mr. Armson in his report¹ examines in some detail what he considers weaknesses of the program and offers suitable remedial advice. We shall review a few highlights of these.

He quickly puts his finger on what may be the commanding reason why the new program is so slow in maturing: "The fact that the forest is viewed as a resource to be exploited is still the most serious impediment to forest management."² Unquestionably, the landlord's lingering emphasis on exploiting this resource and, hence, on administration has interfered with the logical development of a forestry program which should emphasize forest growth and productivity.

As we pointed out earlier, a forest inventory is the backbone and absolutely indispensable ingredient in establishing a forest management policy. The Ontario inventory became available for the first time in 1963: "It was this Ontario Forest Resources Inventory (FRI) which provided the data base for forest management planning on a provincial scale - something previously not possible."³

¹Forestry Management in Ontario 1976. (See also Forest Management in Canada, F.L.C. Reed Associates Ltd. 1978)

²Ibid., p. 4.

³Ibid., Chapter V, p. 51.

Judging by the results of Mr. Armson's investigation, it is clear that the FRI has not evolved as expected; it is obviously not capable of providing the necessary, reliable statistical data for support of management's work.

"During the course of this study no topic elicited more uniform concern than that of inventory and this concern was expressed by field, regional and head office staff of the Ministry, as well as by the representatives from forest industry."¹

The inventory data are only as good as the data gathering and both appear suspect. Use of subjective estimates, poor sampling, doubtful use of extrapolation, etc., have contributed to insecure inventory data. Inadequate provision for keeping information current also weakens its use in operational activities. Moreover, the aggregate data do not appear suitable for use in smaller area units and that's where the action is. Errors can therefore be large. F. Raymond (1974) concluded that "FRI over estimate volumes by one-third when compared to operational cruising values."²

Considering the crucial importance of the inventory tool for achieving the principal objective of forest management -- to keep low-cost, good quality timber supplies flowing to the processing mills, it is rather astounding that the Ontario landlord should have allowed this glaring weakness to endure for so long. According to Armson, "... little development appears to have occurred in Ontario inventory procedures, especially those in the field, during the past decade." (p. 61)

¹Ibid., pp. 52-53.

²p. 54. (See also Forest Management in Canada F.L.C. Reed Associates Ltd., 1978)

On keeping the inventory data current, he says: "I cannot over-emphasize the necessity of accurate input data at the management unit level. Continually the reworking of data of questionable reliability at upper levels produces decisions and recommendations that are likely to be erroneous."

Mr. Armson offers critical comments and advice on an extended range of things that directly or indirectly impinge on forest management. We shall refer briefly to his comments on staff and communication and more comprehensively on access roads and the landlord-tenant relationships.

His main concern with the staff is that they are being poorly deployed and inefficiently used. One comment on deployment is: "During the course of this study it was evident to me that more usually, in northern areas where management was just beginning and access was being developed, there is the greatest need for a management forester of considerable background and knowledge; yet invariably these were the areas where some of the more inexperienced younger foresters are to be found." (p. 135)

On the inefficient use of professional and technical people and why, he states: "It is well to reiterate here that a part of the neglect which I believe the Ministry has shown towards its professional and technical staff undoubtedly stems from a posture, evident not only in Ontario but elsewhere in Canada, toward forests as something to be exploited and administered." Two results flow from this: "First, no premium or recognition is placed by the Ministry on the professional abilities of its practicing foresters. Second, because of the emphasis on administrative ability the perception of difference between professional foresters and forest technicians becomes blurred." (p. 123)

He is equally critical of the lack of facilities of communication as that function affects forest management. He states: "Despite the modern and efficient system within the Ministry for administrative information, the system for the flow of professional and technical information is archaic. If the former relies on electronic media, the latter seems to employ smoke signals. (p. 149)

Forestry Roads

Access roads are vital to forest activities. They have also tended to be rather extensive, and expensive, because while we are waiting for the man-made forest, the supply of timber has to be maintained by pushing the margin of logging steadily outward into virgin forests.

Clearly, an access road is, or should be, a means for achieving one or more objectives. Armson says: "... without all-weather roads, fully effective forest management is not possible." (p. 63) However, the licensee decides on the location and construction of roads which will serve his purpose. These two objectives may be in conflict. Quoting Armson: "The longer term view of the government manager must then frequently conflict with that of the licensee and although compromises can occur, the effectiveness of management invariably suffers." (p. 64)

The B.C. Royal Commission¹ provides some critical observations about road building in relation to controlled clear-cutting, the effect on the ecology and road costs. The Commissioner, Mr. Pearse, states: "The evidence put to the Commission leads me to conclude that, on environmental and silviculture grounds at least, there is excessive concern about clear-cutting per se,

¹Timber Rights and Forest Policy, Vol. 1; Victoria 1976, B.C. Royal Commission.

and insufficient concern about road building." (Royal Commission, p. 282)

Moreover, "The relation between the two is important because heavy pressure to restrict clear-cutting has had the effect of aggravating the need for roads. Rules such as 200 acres maximum cut-blocks, retention of 50% of the stands in the 'first pass' of logging -- necessitate two or three times the extent of road building than would otherwise be required. In light of these formidable costs (ultimately financed in large part through abatements of stumpage charges) and the environmental consequences of roads, the government should, as a matter of urgency, reconsider its present regulations on harvesting patterns." (Royal Commission, p. 283)

Mr. Pearse's exposition on road costs and clear-cuts stands in interesting contrast to some recent proposals presented (for discussion) in a report by the Forestry Division of the Ontario MNR.¹ These proposals are supported by some telling arguments in favour of the restricted clear-cut method. While it is admitted that smaller clear-cuts demand more roads, which will up the road budget, the authors reason that the smaller cuts will, among other things, provide better conditions for regeneration, hence higher productivity, better protection against fire hazards, more safety to wildlife, etc.

We do not pretend to understand all the nuances of the many arguments which, when summed, produce such contrasting views. The locations, northern Ontario and B.C., may account for some of this difference. In any case, an interesting principle emerges: road costs are obviously a function of the size of clear-cuts. The smaller the cut, the more roads are required and the higher the costs.

¹Proposed Policy for Controlling the Size of Clear-Cuts in Northern Forest Regions of Ontario, June 1976 (Ministry of Natural Resources).

We are concerned about this item because wood costs constitute the major factor input cost for the pulp and paper industry (even more so for sawmills).¹ We are again faced with a major trade-off problem which includes economic, social and environmental factors. Possibly, a comprehensive cost-benefit analysis might produce a compromise in the size of the clear-cuts. We do not know.

We would like to suggest, however, that a forest road policy ought to be an integral and essential part of an overall long-term forestry policy. It therefore follows that road policy must be long-term. Moreover, the creation of such a road policy ought to be guided by a reliable inventory, by a policy of intensive or extensive use of certain forest areas and by the time spectrum of new growth. Such a road policy would also have to consider multiple uses and the likely adverse effects on the ecology and wildlife.

The above raises the important question of who should be responsible for financing access roads. On purely economic grounds, we might favour the present ad hoc, expedience approach employed by the tenant, although one might argue that such short-term action can lead to long-term inefficiency. Moreover, when we consider implementing a long-term forest management policy, other factors enter the equation and we are then less certain that the present method is appropriate and most efficient.

In any case, the whole road policy should be reappraised. For economic and other reasons, we would prefer to see each of the Canadian forest landlords assume responsibility for the planning and the specifications of forestry roads and the tenants for constructing them. Because most of these roads serve both private and public needs, their costs might be shared.²

¹Report of the Timber Revenue Task Force 1975.

²Public contribution is especially large in Scandinavia; note also that B.C. tenants are allowed to deduct road costs from stumpage charges.

Landlord-Tenant Relationships

In the ensuing we shall examine briefly some of the arrangements obtaining between landlord and his tenants, license (or lease) and tenure, forest management and timber revenues.

License and Tenure

On request, the landlord (the provincial authority) may confer on his tenant (the company) a license allowing him the use of a certain timber area for a specific length of time. The duration, in the case of the larger tenants, may range from five to 21 years.

Accompanying the license is an agreement or tenure arrangement which sets forth the conditions under which the property is held. This permits the landlord to use the tenure arrangement as an implement of policy -- prescribing what the tenant can do and proscribing what he cannot do, respecting the uses of the conferred timber resource. One condition stipulates, of course, what the tenant has to pay for the privilege of using the resource.

Understandably, because the investment in a mill is large, the tenant is concerned about three main conditions, whatever the tenure system may be, and these are: guaranteed long-term supplies of timber; the right to do his own harvesting; and the level of the landlord's charges.

It would appear that most large tenants have acquired sufficient forest areas. According to one report (Ontario),¹ seven firms, mostly producers of pulp and paper, held 73% of the total productive Crown forest of Ontario under license in 1973.²

¹Report of the Timber Revenue Task Force.

²In 1976, there were 440 licenses, most of them very small. See Table 2-2, p. 11, Forest Management in Ontario 1976.

Similarly, it was noted in a recent study by the provincial office of planning and development of Quebec that "nine companies hold exclusive cutting rights on 92% of provincial timber limits".¹

There were, no doubt, logical historical reasons why the landlord conferred generous tracts of forest lands on some of his tenants. With the arrival of forest management and modern forest technologies, those reasons would no longer seem valid. Armson observes: "These large areas, perhaps justifiable under a regime of exploitation only, cannot be justified when forest management is both possible and feasible." (p. 26)

Now that the annual amount of wood consumed by a tenant can be precisely measured² and then converted into a precise forest area, there are no valid technical reasons why a tenant should hold surplus capacity just for future speculation. Given this, the landlord ought to consider a more precise approach when the license comes up for renewal.

Not all the tenants hold excess forest capacity. One such tenant claimed recently that only one-third of his total requirement came from Crown land, another one-third from his sawmill residues and a final one-third from purchase.³

¹Report in Ottawa Citizen, November 1977.

²For example, one ton of pulp requires roughly 1.3 cunits.

³This company holds over 5,000 square miles of Crown land. See Table II, p. 13, Report of the Timber Revenue Task Force.

Forest Management¹

A measure of confusion appears to exist between the landlord and the larger tenants in the matter of forest management. Currently, the landlord, while retaining the responsibility for implementing management policies (regeneration, silviculture, etc.), requires the tenants to produce management plans for their licensed territories. Mr. Armson comments: "... the responsibility of a licensee for management planning but not management seems illogical." (p. 21) He cites one instance to demonstrate how muddled this approach can become. One tenant had to deal with "two regions, five districts and 28 Ministry staff on matters relating to the licensed area". (p. 23)

Surely this bifocal approach can only produce blurred vision of what needs to be done and so lead to inefficiency of the overall plan.

The question must therefore be raised: who should assume full responsibility for forest management, the landlord or the tenant? Surely not both. Mr. Armson contends that "more effective management is likely when those concerned primarily with the harvesting and utilization of forest crops have control over the location and choice of management, especially silviculture practices which will alter crop yields." (p. 23).

We are satisfied that Mr. Armson would agree that there are other options. We submit that the landlord, being in essence the manager of public property, should be responsible for developing a long-term forest management policy and for the attending programs. This long-term policy would embody a number of program objectives pertaining to regeneration, silviculture, size of clear cut, amount and kind of access roads, protection of the ecology, etc. We believe strongly that because the forest must serve so many diverse needs, both private

¹See Appendix I, p.167 for definition of terms.

and public, these needs are likely to be more adequately served if the provincial government is responsible for the overall planning and for the programs.

Furthermore, we would suggest that the government establish an authority, preferably a Crown corporation, which might be responsible for implementing the long-term policy and the necessary programs, apart from road building. We believe the tenants should share in the accrued costs.

Should, however, the tenant be elected to carry out forestry management, he should be responsible for all aspects of it. In addition, the landlord must then make provisions in the tenure agreement for inspection and monitoring of the tenant's activities. In other words, should the tenant become responsible, the landlord must always be in a position to inspect and enforce those activities that are essential to achieving a productive forestry plan while at the same time guarding the environment.

Timber Revenues

During the long exploitation period, the landlord sought to maximize revenue from his tenants by setting various kinds of levies, but at levels that would encourage further exploitation of the timber resource. The most efficient and effective charge was found to be stumpage, or Crown dues. The landlord's expenses on the forest were small in that period and hence his net revenue, relatively large. In other words, the landlord's main objective was to encourage the use of timber which would create further employment and income and, consequently, boost general revenue. When the landlord finally recognized that the timber crop, sustained by natural growth only, might fail to meet expanding requirements, silviculture and forest management programs were initiated.

The introduction of these programs meant incurring sizeable expenditures. This forced the landlord to examine critically his financial relations with his tenants. The most recent review in Ontario, with accompanying recommendations, is found in a Task Force Report of 1975.¹

This report seeks answers to two basic questions:

1. What is the appropriate level of charge for the use of Crown timber?
- and 2. What is the fairest and most effective method of collecting such timber revenue?

The level of charge established would depend on three factors:

- a) The industry's ability to pay;
- b) The level of charges in other jurisdictions;
- c) The cost incurred by the landlord in regenerating and managing his forests.

After testing and rejecting a few other approaches, the existing collecting system was recommended. However, expenses on forestry protection and management charges would be combined and called a "tenure" charge. The negotiated bonus and bid would be retained and also the Crown dues, the major revenue source.

After a careful examination, a revenue intake level of \$40 million was recommended for fiscal year 1976-77. About 80% of this would accrue from Crown dues and 10% from each of the other charges.

It was also decided that in view of the market price (and capacity) fluctuations experienced by the processors of wood, Crown dues ought to be indexed monthly, using a three-month moving average of the industry selling price of the products for which timber is used.

¹Report of the Timber Revenue Task Force to the Treasurer of Ontario and the Minister of Natural Resources, October 1975.

The report is concise and commendable. One is not surprised that apart from indexing the old levies were retained, although placed on a sounder footing. Two factors, Crown land and very large tenants, almost preclude establishing a free timber market and a market price. Even in Scandinavia, where some 75% of the forest resource is privately held by numerous owners, a genuine timber market and price do not operate. The timber price is centrally established annually through negotiation between organizations of buyers and sellers. "The sales conditions and prices of minor assortments are negotiated on the local level."¹ No doubt the price so established tends to reflect the current and expected prices of the timber products.

We have no way of assessing whether the given revenue target proposed (\$40 million) is adequate. We must assume that it reflects the estimated costs to the government of managing the forest, as well as what the Crown timber may be worth to tenants. Unfortunately, the size of the target may or may not affect the planned forestry programs because the forestry dues often get lost in General Revenues. Experience suggests that under "special" circumstances, other programs may be given higher priorities, thus reducing the budget for the forestry programs.

In view of the above, we would urge that the landlord earmark the forest revenues collected each year for the forest management programs. Furthermore, in view of the extra investment needed in order to expand forest management programs over the next several years, so that forest yields may ultimately equate with timber consumption, revenues from dues may have to be augmented from General Revenues.

¹Forestry of Norway. The Norwegian Forest Society, Oslo, 1976.

World Forest Resources

The world demand on the forests for softwood by the wood-using industries is enormous and expanding. As may be seen in the accompanying tables, the resources are also large but not inexhaustible. For example, in Scandinavia, a large softwood area, the annual removal now approximates the annual forest growth. Canada is also approaching such a balance. While no accurate measurement of the world stock exists, the following table gives useful approximations.

Table I shows the amount and distribution of Canadian forest by kind and allocation, also the amount and distribution of soft and hard wood.

Table 1

Forest Land, 1973 (latest available)

	<u>Acres (000)</u>	<u>Percentage</u>
Reserved forest land [*]	38,235	4.7
Allocated to wood production (Crown)	348,647	43.3
Allocated to wood production (private)	56,120	7.0
Unsuited to regular harvest	19,961	2.5
Unallocated	96,828	12.0
Too remote - uneconomical ^{**}	246,092	30.5
Total forest land	805,883	

Forest Volume, 1973

	<u>Cubic Feet (millions)</u>	<u>Percentage</u>
Conifers	533,734	79.3
Broad-leafed	139,426	20.7
Total	673,160	

^{*} Parks, etc.

^{**} Including Yukon and North West Territories

(CPPA, 1976)

Table 2 shows the amount and distribution of hard wood and soft wood by Province.

Table 2
Forest Volume by Province, 1973
(million cu. ft.)

	Conifers	%	Broad-leafed	%	Total	%
Newfoundland	7,775	1.5	1,241	0.9	9,016	1.3
P.E.I.	136	-	64	-	200	-
Nova Scotia	6,283	1.2	2,672	1.9	8,955	1.3
New Brunswick	14,655	2.7	5,793	4.2	20,448	3.0
Quebec	96,965	18.2	33,466	24.0	130,431	19.4
Ontario	91,390	17.1	58,269	41.8	149,659	22.2
Manitoba	12,174	2.3	3,584	2.6	15,758	2.3
Saskatchewan	10,343	1.9	7,011	5.0	17,354	2.6
Alberta	33,638	6.3	20,102	14.4	53,740	8.0
B.C.*	260,375	48.8	7,224	5.2	267,599	39.8
Canada	533,734		139,426		673,160	

* Mature timber only

(CPPA 1976)

Table 3 suggests that North America and the USSR are the principal owners of softwood resources,¹ while South America and Asia, in particular, have an abundance of hardwood.

¹ A rough calculation suggests that Canada has about 10 hectares per person; Scandinavia and the USSR about 3 and the USA, 1.

Table 3

World Forest Resources
(millions of acres)

	Conifers	%	Broad-leafed	%	Total	%
North America	988	35.1	568	14.5	1,557	22.5
Central America	49	1.7	99	2.5	148	2.1
South America	35	1.2	1,275	32.5	1,310	19.0
Africa	5	-	292	7.5	469	6.8
Europe	185	6.6	161	4.1	346	5.0
USSR	1,366	48.5	524	13.4	1,890	27.4
Asia	161	5.7	828	21.1	988	14.3
Pacific Area	27	1.0	170	4.3	198	2.9
	<hr/> 2,816		<hr/> 3,917		<hr/> 6,906	

(World Forest Resources, FAO, 1974)

Table 4 which shows the growing stock of softwood, reinforces that picture. The distribution serves the Nordic countries well as long as softwood is the principal ingredient of paper products.

Table 4

World Forestry Data
(billion cu. ft.)

	Growing Stock Conifers (1963)	Percentage
Canada	671	16.7
U.S.A.	494	12.3
Central America	7	-
South America	18	-
Africa	4	-
Europe	268	6.7
U.S.S.R.	2,331	58.0
Asia	212	5.3
Pacific	14	-
	<hr/> 4,109	

(CPPA Table 48, 1977)

Table 5 indicates the regional distribution in North America of wood fibre production. We note that while Canada has some 37% of the North American softwood production, almost half of this in B.C., we show only 13% of the total hardwood production.

Table 5

North American Wood Fibre Production
(millions of cu. m.*)

	Softwood	Percentage	Hardwood	Percentage
<u>Canada</u>				
B.C.	92	17	-	-
Prairies	19	4	12	5
Ontario	25	5	10	4
Quebec	41	8	6	2
Maritimes	19	4	5	2
Total:	196	37	33	13
 <u>U.S.A.</u>				
South	166	31	101	38
North	37	7	119	45
Pacific Coast	88	17	9	3
Rocky Mountains	42	8	3	1
Total:	333	63	232	87
 Total North America:	 529	 100	 265	 100

* 1 cu. m. - 1.308 cu. yds. - 35.3 cu. ft.

(World Fibre Supplies, Paul H. Jones, 1975)

One appreciates, of course, that comparing the present or future worth of forests within a country or among countries is a hazardous exercise. The worth of a forest depends on a great many factors such as the soil and climatic conditions, topography, species, age composition, size of trees, forest density, accessibility to users, network of roads, etc. These and others must be evaluated before any reliable economic comparison can be made.

Accessibility, for example, is a most crucial factor. An otherwise splendid-looking forest may be so far from the user as to be economically worthless to him. It was noted in Tables 3 and 4 that the USSR has an abundance of softwood timber, and so it has. However, that country consumed an enormous amount of its accessible timber in the vast rebuilding program following World War II. Most of its available timber is now in the far north and so much less accessible.

Similarly, Canada has vast forest stands in the Yukon and Northwest Territories, but their economic worth is low because of their lack of accessibility. In addition, the future worth of a forest depends, among other things, on the size of the investment and the effectiveness of the forest management policies under way now.

Concluding Observations

Our forests are immense but not inexhaustible. Slow growth, especially in the northern areas, makes the rotation period long and the annual yield small, although good husbandry can augment the yield considerably. The demand for wood¹ continues to expand. Advancing technologies have increased the

¹Including a large lumber market in the U.S.

versatility and expanded affluence at home and abroad has created an enormous demand for wood-based products; with strong potential for wood-based foodstuff and energy (production of Methanol), these developments are exerting heavy pressures on our forests. The pulp and paper industry alone used what amounts to one cord per capita in 1974.

This relentless demand for wood makes it mandatory on us, as a society, to assess carefully the forest resource. We shall, for example, have to decide now whether we want to ride the expected demand curve for wood which will likely require a doubling of our forest productivity in the next 40 years or so. If that be our decision, our forest investment needs to be significantly larger than at present.

However, while we are contemplating forest investments, we shall also have to examine carefully and decide how we are to deal with the "other" demands on the forest. The ecologist warns not to perpetrate rash and unnatural acts in the forest which are likely to endanger the delicate balance of nature. The environmentalist warns, among other things, enterprises not to pollute air and water beyond their capacities to absorb. We accept these as legitimate warnings. We also appreciate that all of these warnings may put constraints on forest activities, especially as they pertain to the north.

Apart from the above facts of life, there is the burgeoning demand for recreational space. A Swedish author pointed to this rather succinctly in an article, as this function pertains to Sweden (a resumé): "We cannot ignore 26,000 hunters, 600,000 recreational fishermen and some 2.5 million Swedes who use the forest for cross-country skiing, walking, hiking, etc."¹

¹Current Sweden, June 1973.

While in relative terms we may not face such magnitudes in Canada, the demand is there and it is expanding rapidly.

Having recognized the relevance and importance of these varied demands, it is equally obvious that we cannot ignore the economic facts of life. People who live in and near forest areas must be able to satisfy their expectations of maximum employment and income security from this great resource.

Nor can we ignore the fact that all these growing demands are making the forest more valuable and wood a great deal more expensive. As a consequence, we have to decide if we want to make the wood-using industries more competitive by emulating our competitors who subsidize various forest programs.

The task of society, then, and it is a difficult one, is to find a suitable accommodation for these varied, but legitimate, demands on the forest. We are hopeful that the Commission will arrive at a more sensible accommodation than we now have. The Commission must assemble, assess and weigh the relevant facts of the situation, but more important, because this is after all a people program, the Commission must solicit the view not only of the experts but also the views of those directly on the firing line. This mixture of digested facts and people participation may, hopefully, prove to be an indispensable technique for reaching an acceptable accommodation whenever and wherever industrial decisions are contemplated.

PART II

THE PAPER AND ALLIED INDUSTRIES

The National Importance of Canada's Wood-based Industries

The importance to Canada of the industries that depend for their existence on the forest resource is enormous. These industries include the paper and allied industries; wood industries (lumber); furniture and fixtures; and printing, publishing and allied industries. In addition, one might have added a large slice of the housing industry and logging.¹ We shall omit both. The following magnitudes will demonstrate the size and importance of the above four groups of industries.²

Employment	380,000
Wages & salaries	\$4.9 billion
Value, shipments	\$18.9 billion
Value added	\$9.0 billion

Percentage of Total Manufacturing

Employment	21.8
Wages & salaries	22.5
Shipments	16.7
Value added	21.2

Another comparison shows that employment in these wood-based industries is roughly the same as in the two largest manufacturing groups of industries

¹Logging employment, 1974, estimated at about 60,000.

²Manufacturing Industries of Canada; National and provincial areas; 1976 Catalogue 31-201 Annual.

combined, transportation equipment (162,000) and food and beverage (220,000).

It is fitting that the wood-based industries should account for about one-fifth of Canada's manufacturing output and employment. They trace their existence to the country's most valuable renewable resource.

The conglomerate is national in scope and comprises an estimated 8,500 establishments. As might be expected, most of them are population and income oriented and so, urban centered. Some 2,600 or 30% are located in Quebec; 3,200 or 37% in Ontario; and 1,200 or 14% in British Columbia.

One could assume with some confidence that when the services and other related activities that are associated with these wood-based establishments are taken into account (the multiplier effect), possibly one million workers (10% of the workforce) depend directly and indirectly on the forests for their jobs. While we do not intend to deal further with the total group, we felt it to be of interest and incumbent to point out briefly the importance of them to the Canadian economy and so recall the great significance of the forest as a resource. As we demonstrated earlier, the forest resource has not received the kind of attention it deserves, neither with respect to long term planning nor intense husbandry. We assume that one reason for this lack of concern is that the vast physical dimensions of the resource have obscured its economic limitations. Unfortunately, this serious neglect is rapidly increasing the cost of the resource to the many users and so jeopardizing their future and the future of a great many workers.

THE PAPER AND ALLIED INDUSTRIES

The largest of the four composite groups of industries referred to above is the paper and allied industries. This aggregate produces pulps, newsprint and a very large assortment of papers and paperboard. The group also includes a large number of converters which produce paper and paper by-products. In 1974, this aggregate of industries employed 131,000 workers in 650 establishments across the country. The value of its shipments amounted to \$8.1 billion, its value added, \$4 billion, and it exported \$4 billion worth of products. Its importance to the Canadian economy may be seen from its weights in total manufacturing.

<u>% Paper and Allied/Total Manufacturing 1974¹</u>	
Employment	7.4
Wages and salaries	8.7
Value Shipments	9.9
Value Added	10.5

In Table 6 the number of pulp and paper mills is shown in brackets. The total number of converters is therefore 503 (650 - 147) for the country as a whole. These employ some 45,000 workers or on average about 90 employees per mill. As a group they produce a fantastic number of products converted from paper and paperboard. Converters serve primarily local demand, hence they are found in and around cities and towns.

It will be noted from the same Table that while the converters are well represented across the country, the concentration is particularly heavy in Ontario, although in terms of population and per capita income, the main determinants of demand for these products, the concentration is not excessive.

¹Cat. 31-203 Statistics Canada. Unless otherwise indicated, 1974 statistics will be used. 1975 and 1976 statistics are affected by work stoppages of 1975 and by reduced capacity operation in both years. Later data are not available.

Table 6

Regional Distribution, Paper and Allied 1974

Region	Estab.	Employment	%	Wages and Salaries \$(000)	%	Value Added \$(000)	%
Atlantic	35(19)	13,170*	10.0				
Quebec	208(56)	45,367	34.6	505,624	33.1	1,195,122	30.3
Ontario	294(37)	47,404	36.1	512,825	33.6	1,221,616	31.0
Prairies	51(11)	4,580*	3.5				
B.C.	62(24)	20,768	15.8	302,128	19.6	849,389	21.5
Canada	650(147)	131,275		1,525,816		3,945,031	

* estimates

(Statistics Canada)

The following will provide a short summary of size and activity of four groups of converters.¹

a) Corrugated Box Manufacturing:

84 establishments employing 11,500 workers

wages and salaries: \$114 million (annual average: \$9,900)

value of shipments: \$528 million; value added: \$208 million

b) Folding and Set-Up Box Manufacturing:

98 establishments employing 7,800 workers

wages and salaries: \$72.4 million (annual average: \$9,280)

value of shipments: \$280 million; value added: \$131 million

¹From Statistics Canada Cat. 31-203.

c) Paper Bag and Plastic Bag Manufacturing:

88 establishments employing 6,920 workers

wages and salaries: \$65.5 million (annual average:\$9,500)

value of shipments: \$432.7 million; value added: \$155.7 million

d) Miscellaneous Paper Converters:

219 establishments employing 17,420 workers

wages and salaries: \$161.7 million (annual average: \$9,280)

value of shipments: \$760.2 million; value added: \$346.8 million

All of these are domestically oriented with local markets; units are very small, only some 60 of the 500 establishments have more than 200 employees, the vast majority have less than 50. They have shown some increase in output but very little increase in employment, hence there have been some productivity gains. Very little of the \$2 billion worth produced in 1974 was exported (some \$30 million in 1973). However, imports of these products from the U.S.A. are increasing; \$65 million in 1970 and some \$100 million in 1973.

The Pulp and Paper Industry

The pulp and paper industry is the principal component of the paper and allied industries. It has 66% of the composite employment, 72% of wages and salaries and 77% of value added for the group as a whole. In contrast to the relatively small 500 converters, most of the 147 pulp and paper mills are large, some very large. While average employment per mill is nearly 600 workers, 26 of the mills (18% of total) have 1,000 or more workers. These account for 37% of total value added for pulp and paper and over \$2 billion worth of produce shipped -- which is more than the total value of shipments shown by the 500 converters.

Pulps, groundwood, sulphite bleached or unbleached, sulphate bleached or unbleached, etc., form the backbone of the paper industry. From the various pulps come newsprint and between 200 and 300 kinds of paper and paperboards which go to meet personal, educational, cultural, industrial and commercial needs at home and abroad.

While some of the members of this composite group, paper and allied industries, face a number of similar problems such as high and rising costs and competition, especially from without (matters we shall examine later), our emphasis from now on will be on the pulp and paper component, in part because of its significant contribution to so many remote areas and their peculiar problems, in part because of its contribution to Canada's export earnings, and also because of its employment and income generating power in the Canadian economy.

The Location

Harvesting and the transforming of timber into various products for sale at home and abroad was the principal generating force that opened up and helped the development of so many parts of the country during the past century. The pulp and paper industry participated actively in this and it is still a major support to our regional economies. The pulp and paper industry is national in scope and, by and large, a non-urban industry. Timber and water dictated the location and that meant often establishing operations in remote locations. Most of these remote communities continue to be almost totally dependent on the forest economy for their existence and for the economic and social well-being of their people. More than half of the 147 pulp and paper mills operate in locations where they constitute the only option.

The economic underpinnings of many of these remote communities seem rather tenuous, even precarious. They are most often one-industry towns of less than 10,000 people, depending primarily or solely on the fortune of one employer, either pulp or newsprint. Such a community is, of course, only as secure as that one-industry employer. The degree of that security depends partly on his ability to maximize all available opportunities. He can keep shoring up that security by maintaining the mill in good repair and further augment its productivity by following an investment strategy of modernization. Where the opportunities exist, he may pursue horizontal and vertical integration, thus minimizing some of the risks. We recognize that he can do less to influence the strength or fickleness of markets, especially the foreign markets where we dispose of some 70% of total gross production of pulp, newsprint and other paper and paperboard products.¹ On the other hand, these remote communities and employers do have one advantage -- with foresight and sound forest management, the raw materials base need not be exhausted. We shall comment further on this point at a later stage.

The most notable category shown in Table 7 would be the gross wage and salary package which exceeded \$1 billion, and the sharp divergence between wages and salary per employee and value added per employee in 1974. The customary relationship of these two are 1:2, when price stability obtains. Sudden sharp increases in several pulp and paper product prices in 1973 and 1974 distorted some of the previous relationships.

¹90% of the newsprint; 80% of this to the U.S., usually on long-term contracts.

Table 7National Profile and Importance - Pulp and Paper

	<u>1974</u>	<u>1973</u>
Employment	86,203	80,085
Wages and salaries (\$millions)	1,097	884
Wages and salaries per employee	\$12,727	\$11,040
Value shipment (\$millions)	5,703	3,791
Value added (\$millions)	3,049	1,813
Value added per employee	\$35,370	\$22,633

(Statistics Canada, Cat. 36-204)

As may be seen from Table 8, the pulp and paper industry does not rank especially high in terms of employment, being a capital intensive industry; however, it does rank near the top in terms of value added per employed worker. Among other things, Table 7 showed value added per employee at \$35,370 for 1974. This is one of the highest per employee figure for any industry or industry group.

Table 8Weights, Pulp and Paper in Total Manufacturing

	<u>1974</u>	<u>1973</u>
Employment	4.8	4.6
Wages and salaries ¹	6.2	5.8
Value of shipments	6.9	5.7
Value added ²	8.1	5.9

¹Note comparison with total manufacturing (in Table 7). Wages and salaries per employee, \$9,830 (1974); \$8,693 (1973)

²Value added per employee, \$21,082; \$17,570

Others are: primary metal industries (\$23,800); metal fabrication (\$20,760); machinery industries (\$20,000); transportation equipment (\$24,860); chemical and chemical products (\$32,200); electrical products industries (\$18,900); and petro-coal products industries (\$56,200). Value added per employee for total manufacturing was \$21,000 in 1974.

This information simply points out that the pulp and paper mills, like those from the chemical products industry and the petro-chem mills, all operate with advance technologies that are highly capital intensive.

Both of these profiles, Tables 9 and 10, confirm that the pulp and paper industry is well represented from coast to coast. However, given the raw material base, the pull of the products markets determines the location of specific industries. Thus, the strong and persistent demand for newsprint from north and northeast U.S.A. gave Quebec the opportunity to become a world producer of newsprint.

Table 9

Distribution of Value Added and Employment by Province
1974
(Pulp and Paper)

	Value Added (\$millions)	%	Employment	%
Canada	3,031		86,200	
Newfoundland	104	3	3,325	4
Nova Scotia	103	3	2,500	3
New Brunswick	237	8	5,300	6
Quebec	937	31	32,000	37
Ontario	717	24	22,000	26
Prairies	142	5	2,590	3
B.C.	787	26	18,370	21

(Statistics Canada, Cat. 36-204 Annual)

Table 10

Percentage Distribution by Region
1974
(Pulp and Paper)

Est.	Region	Employment	Wages and Salaries	Value Shipments	Value Added
19	Atlantic	13.1	12.6	14.6	14.8
56	Quebec	37.1	30.6	32.5	31.1
37	Ontario	25.4	24.2	22.9	23.6
11	Prairies	3.0	3.0	3.9	4.6
24	B.C.	21.3	25.0	26.0	25.8

(Statistics Canada, Cat. 36-204 Annual)

As will be noted from Table 11, 46% of Canada's newsprint production was carried out in Quebec in 1974. The province also produced 35% of the printing and writing papers (and wrapping paper), 36% of the paperboard and 43% of the other paper and paperboard products. Ontario exceeded Quebec in the case of printing and writing paper -- which is a most desirable product because it yields more than twice the value added per unit compared with newsprint.

Table 11

Percentage Shipments of Basic Paper and Paperboard
by Province, 1974

	Newsprint	Print and Writing Paper	Wrapping Paper	Paper- board	Others
Quebec	46	35	35	36	43
Ontario	21	59	14	31	36
Other	<u>33</u> 100	<u>6</u> 100	<u>51</u> 100	<u>33</u> 100	<u>21</u> 100

(Statistics Canada, Cat. 36-204 Annual)

Table 12 provides the tonnage output of paper and paperboard (excluding newsprint for 1974, also the distribution of the various groups or single products. The leading product in terms of volume appears to be kraft linerboard, which is regarded as a truly world product. However, writing, printing and wrapping papers also rank high.

Table 12

Relative Magnitudes (production) of Non-Newsprint
Paper and Paperboard, 1974

	Tons	%
Printing and specialty papers	416,408	8
Book and printing	248,408	5
Fine papers	430,873	9
Misc. fine papers	68,743	2
Sani and tissue	360,514	7
Wrapping paper	709,107	14
Building paper	157,807	3
Liner kraft	1,128,607	23
Other containers and box boards grades	<u>1,448,275</u>	<u>29</u>
	4,968,742	100

(Statistics Canada, Cat. 36-204 Annual)

Capital Expenditure Expansion

Table 13 shows capital and repair expenditures for the 1960-77 period. We show the two sub-categories of each of these and the percentages of each to the totals.

It is difficult to extract much practical meaning from these investment figures. It will be appreciated that they are affected by cost inflation, especially in the 1970s, and by changes in the composition and the aggregate capacity.

Since 1960, industrial capacity has almost doubled. From that we conclude that if investment costs had remained constant, the equivalent amount invested in 1977 would be below the \$500 million mark. The difference between

Table 13

Capital and Repair Expenditures at Canadian
Pulp and Paper Mills
(\$000)

Year	Total	CAPITAL				REPAIRS			
		Constr'n	%	Machinery & Equip.	%	Constr'n	%	Machinery & Equip.	%
1960	233.9	27.8	12	113.5	49	7.8	3	84.8	36
1961	238.7	33.1	14	105.3	44	7.7	3	92.6	39
1962	254.5	34.5	14	113.3	44	10.5	4	96.2	38
1963	289.4	36.4	13	145.2	50	11.0	4	96.8	33
1964	415.6	64.7	16	229.0	55	9.2	2	112.7	27
1965	515.2	102.2	20	281.6	55	12.9	2	118.5	23
1966	657.8	127.2	19	379.2	58	12.3	2	139.1	21
1967	587.2	99.0	17	319.5	54	10.6	2	158.1	27
1968	407.4	58.2	14	181.9	45	10.7	3	157.0	38
1969	514.2	97.1	19	228.6	44	11.5	2	177.0	34
1970	690.6	122.3	18	366.0	53	12.5	2	189.8	27
1971	724.8	128.3	18	377.9	52	11.6	2	207.0	28
1972	643.5	111.5	17	297.5	46	15.4	2	218.7	34
1973	623.7	77.1	12	264.8	42	17.5	3	264.3	42
1974	845.4	102.9	12	365.8	43	28.7	4	348.0	41
1975	826.0	87.0	11	399.9	48	24.1	3	315.0	38
1976	1,068.0	144.1	13	489.6	46	32.8	3	401.5	38
1977	1,171.0	168.9	14	521.3	45	35.1	3	445.7	38
1978	1,167.2	111.4	10	524.5	45	40.1	3	491.2	42
1979	1,227.4	86.9	7	572.5	47	48.2	4	519.8	42

(CPPA)

this figure and the current dollars invested (almost \$1.3 billion) must be accounted for by cost inflation and by the changes in composition of the investment.

The rapid changes in these figures, especially in the last few years, would appear to make the costs of investment prohibitive. One must recall, however

that the gross income of these paper industries has also accelerated at a rapid pace during the last several years. It is estimated (see CPPA 1977) that the gross income of the group has expanded, in current dollars, almost four-fold since 1960. That would suggest that the ability to invest is still there.¹

Nevertheless, it is generally agreed that construction costs of new facilities have expanded rapidly. One study commented: "... the investment requirements for new capacity zoomed skyward; by 1974 costs per ton of new capacity were two to three times their 1970 level."²

The limits imposed by high costs on constructing new mills may, for the foreseeable future, constitute a benefit to the industry. A large segment of it is still in much need of modernization. There is an urgent need to replace and upgrade unproductive machinery and equipment. Such investments have taken place over the years but, apparently, less extensively and at a slower pace than required. During the five-year period, 1973-78, when the expansion of capacity was particularly slow (in terms of the 20-year average), one would have anticipated that capital investment in machinery and equipment would have been a great deal higher than the statistics suggest.

Capacity is expected to continue to advance at a slow rate during the 1978-81 period³ and much of this expansion, especially of the paper products, will be in the form of improving machinery and equipment.

¹High profits in 1978 and 1979 further support this claim.

²Standford Research Institute, 1977. Investment Outlook and Related Federal Policies for the Paper Industry.

³Canadian Pulp and Paper Capacity, August 1979.

Pulp and Paper Expansion and Exports

Tables 14 to 18 inclusive provide a statistical overview of the expansion of pulp and paper during the past two decades or so. The tables also indicate growth of exports and percentage exported.

Table 14, wood pulp, includes the different kinds of pulp that singly, or in mix, form the principal ingredient of the many paper products. For example, in 1974, of the total pulp output of 21.5 million tons sulphate pulp (SO_4) constituted 43%; groundwood, 39%; and sulphite pulp (SO_3), 13%. The remaining 5% was made up of semi-chemical pulp, defibrated and exploded, dissolving and special "Alpha" pulps and screenings.

The Table also shows that output of pulp doubled during the period 1955-74; that a rather low and erratic operating ratio obtained from time to time, especially low in 1958, 1975, 1976, not a surprising phenomenon in view of pulp demand being derived demand -- that is, depending on the demand behaviour of various paper products. Pulp demand tends to be buffeted by the market pulp sold and also from time to time by various paper products when the national economy behaves erratically. The most dynamic factor affecting pulp output has been the 1960s expansion of sulphate pulp, thanks to strong world demand. However, the great lumpiness of investment tends to produce periods of over-supply, followed by periods of under-supply which produce gyrations in the growth curve and employment.

Table 15 provides information about trends in output of sulphate pulp, amount and percentage exported and the volume exported when related to total pulp exports.

The strong and persistent world demand for pulp that would yield strong, brown paper, paper bags, etc., stimulated the expansion and output of sulphate pulp in Canada, especially in interior British Columbia. The peak years were

in the 1960s when capacity and production of sulphate almost tripled (184%, 1960-1969). From 1955 to 1974, output shot up from 1.5 million tons to 9 million tons. The portion exported, mostly market pulp, remained remarkably stable at or near 60% which happens to be the average for the 19-year period to 1974.

Exports of sulphate more than doubled during the first decade after 1955 and then more than doubled again by 1974. Because exports of other pulps increased rather slowly during the above period, the share of sulphate to total pulp exports soon assumed dominance. As the last column in the table demonstrates, the share of sulphate doubled between 1955 and 1970. So far in the 1970s the share seems to be stabilized somewhat about 80%.

Table 16 shows tonnage output of newsprint, volume exported, percentage exported and the share of newsprint in total exports of pulp and paper.

It is worth reflecting that in the 1950s, Canada supplied about one-half of the world's total newsprint consumption. Some 20 years later, we are still a major supplier, some 65% of the U.S. newsprint needs (although down from 75%) and enough exported elsewhere to add up to about 40% of the total world newsprint consumption.

The information suggests that the newsprint output had reached a remarkably high level by 1955; also that Canada was producing several times the amount it consumed. As will be noted, the percentage of production exported has eased off reluctantly over the years, but almost 90% of output is still being exported. On the other hand, the share newsprint exports holds of total exports of pulp and paper has declined steadily from roughly two-thirds to one-half. The marginally slower rate of increase in exports of newsprint and the rapid increase in world demand for sulphate pulp accounts for this slippage.

Tables 17 and 18 provide summaries of production and exports of a number of paper products, excluding newsprint. Most of these are produced for the home market although considerable expansion of exports, from a very low level, has taken place in the post-war period. For example, while total paper production doubled between 1965 and 1974, exports increased from 16% to 36% of output. Similarly, although far more modestly, total paperboard's output increased 70% over the same period, exports of these products increased only from 16% to 23%. An estimated one-half of the export value of some \$390 million of Canada's paper and paperboard is purchased by the U.S. The other half is marketed in a number of other countries.

The world export of kraft linerboard in 1974 was estimated at 3.3 million tons; the U.S. share of this was 50% with Sweden and Finland contributing 37% and Canada only 11%. The world market for corrugated medium is very small, Canada having some 10% in western Europe. Kraft papers (strong papers for sacks, etc.) are produced mainly for domestic use in Canada. Scandinavians supply most of the European import needs. Similarly, boxboards are produced for the Canadian market, roughly one million tons.

Table 14

Wood Pulp, 1955-76 and 1978

Production (000T)	Capacity (000T)	Operating Ratio	Exports (000T)	Percent Exported
10,151	10,830	94	2,366	23
10,734	11,319	95	2,374	22
10,425	12,198	85	2,283	22
10,137	13,044	78	2,219	22
10,832	13,073	83	2,450	23
11,461	13,185	87	2,602	23
11,779	13,602	87	2,869	24
12,133	14,146	86	3,044	25
12,474	14,662	85	3,339	27
13,742	15,446	89	3,636	26
14,573	16,215	90	3,853	26
15,958	17,488	91	4,096	26
15,857	18,981	84	4,269	27
16,762	20,072	84	4,971	30
18,590	21,411	87	5,775	31
18,308	21,680	84	5,581	30
18,234	22,844	80	5,676	31
19,239	22,620	85	6,102	32
20,462	22,583	91	6,546	32
21,518	24,446	88	7,097	33
16,660	24,614	68	5,513	33.2
19,894	25,301	77	6,116	30
19,646 ¹			6,638	33.9

¹Estimated (CPPA/79)

Source: CPPA/77

Table 15
Sulphate Production and Exports
 (1955-76 and 1978)

Year	Sulphate Production	Sulphate Exports (000T)	Percent Exported	% Exported to total pulp exported
1955	1,471	892	61	38
1956	1,597	916	57	39
1957	1,706	1,016	60	45
1958	1,896	1,149	61	52
1959	2,234	1,377	62	56
1960	2,442	1,466	60	56
1961	2,697	1,635	61	57
1962	2,926	1,681	57	55
1963	3,136	1,883	60	56
1964	3,420	2,018	59	56
1965	3,904	2,245	56	58
1966	4,605	2,615	57	64
1967	5,068	2,966	59	69
1968	6,034	3,742	62	75
1969	6,945	4,503	65	78
1970	6,707	4,290	64	77
1971	7,132	4,529	64	80
1972	7,885	4,988	63	82
1973	8,893	5,486	62	84
1974	9,139	5,788	63	82
1975	7,050	4,609	65	84
1976	7,862	5,075	64	83
1978	8,435 ¹	5,545	66	83

¹Estimated CPPA/79

Source: CPPA/77

Table 16

Newsprint Production and Exports

Year	Production (000T)	Exports (000T)	Percent Exported	% Newsprint Exports to total pulp and paper exports
1955	6,191	5,805	93.7	65.8
1956	6,469	5,972	92.3	69.6
1957	6,397	5,907	92.3	70.0
1958	6,096	5,609	92.0	68.8
1959	6,394	5,953	93.1	68.8
1960	6,739	6,265	93.0	68.9
1961	6,735	6,216	92.3	65.9
1962	6,691	6,170	92.2	64.5
1963	6,630	6,100	92.0	61.0
1964	7,301	6,759	92.6	61.6
1965	7,720	7,157	92.7	61.7
1966	8,419	7,764	92.2	61.5
1967	8,051	7,330	91.0	58.8
1968	8,031	7,422	92.4	56.2
1969	8,818	8,089	91.7	54.3
1970	8,719	7,988	91.6	54.4
1971	8,455	7,641	90.4	52.2
1972	8,820	8,120	92.1	52.0
1973	9,140	8,340	91.2	50.6
1974	9,548	8,711	91.2	50.2
1975	7,679	6,863	89.4	50.7
1976	8,088	7,100	87.8	49.4
1978	8,811	7,975	90.5	49.2

Source: CPPA/79

Table 17

Select Groups of Paper and Paperboard (Excluding Newsprint)
(Select Years, 1950-76 and 1978)

Production

Year	Total Book & Writing Paper (000T)	Total Paper (000T)	Liner- board (000T)	Total Con- tainerboard (000T)	Total Paper & Boxboard (000T)	Total Paper & Paperboard (000T)
1950	214	616	214	366	877	1493
1954	269	709	244	379	939	1648
1959	382	943	355	540	1256	2199
1964	495	1138	522	762	1717	2855
1969	759	1670	777	1113	2301	3970
1972	971	2052	925	1382	2602	4654
1974	1164	2392	1203	1666	3046	5438
1975	748	1668	782	1121	2097	3748
1976	842	1821	950	1294	2280	4100
1978 ¹	1282	2403	915	1345	2474	4875

¹Estimated, CPPA/79

Source: CPPA/77

Table 18

Exports of Paper (Ex. Newsprint) and Paperboard
Totals and Select Products 1965-76 and 1978

Year	Total Paper (000T)	Book & Print Writing Paper (000T)	Wrapping Paper (000T)	Total Paper- board (000T)	Liner- board (000T)	Total Con- tainerboard (000T)
1965	194	44	31	245	123	170
1966	259	42	47	297	182	240
1967	329	66	101	287	180	234
1968	342	118	115	315	190	240
1969	406	118	99	353	197	270
1970	538	186	113	384	201	304
1971	631	177	143	396	173	306
1972	805	156	218	481	222	368
1973	864	179	296	581	311	451
1974	867	247	267	589	414	510
1975	665	167	187	295	198	251
1976	697	220	203	408	288	370
1978 ¹	1106	308	284	494	255	418

¹Estimated, CPPA/79

Source: CPPA/77

Table 18(a)

Domestic Consumption, Imports and Imports as Percentage of Domestic Consumption
(thousands of short tons)

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
<u>KRAFT PAPER</u>								
Domestic Consumption	345	351	369	356	369	383	388	437
Imports	11	22	22	17	24	32	38	43
Imports as % of Consumption	3.2	6.3	4.6	4.8	6.5	8.4	9.8	9.8
<u>KRAFT LINERBOARD</u>								
Domestic Consumption	502	533	566	568	564	626	667	738
Imports	16	12	13	15	16	15	22	64
Imports as % of Consumption	3.2	2.3	2.3	2.6	2.8	2.4	3.3	8.7
<u>SEMI-CHEMICAL CORRUGATING MEDIUM</u>								
Domestic Consumption	164	206	227	230	247	279	303	334
Imports	16	23	21	29	37	41	21	28
Imports as % of Consumption	9.8	11.1	9.3	12.6	15.0	15.0	6.9	8.3
<u>BOXBOARD</u>								
Domestic Consumption	598	606	641	634	659	690	725	772
Imports	50	51	61	68	89	98	116	141
Imports as % of Consumption	8.3	8.4	9.6	10.7	13.6	14.1	16.0	18.3
<u>FINE PAPERS (Ex. Groundwood)</u>								
Domestic Consumption	382	416	430	436	459	536	614	654
Imports	20	26	40	40	45	61	70	100
Imports as % of Consumption	5.2	6.3	9.3	9.2	9.8	11.4	11.4	15.3
<u>SANITARY PAPERS</u>								
Domestic Consumption	204	208	236	238	243	257	284	308
Imports	2	6	5	3	6	7	7	6
Imports as % of Consumption	1.0	2.9	2.1	1.3	2.5	2.7	2.4	1.9

Sources: Domestic Consumption - CPPA Domestic shipments plus imports
Imports - Statistics Canada

Table 19

Export and Import Values for Select Years
(Paper Products, Except Newsprint)
(millions of dollars)

<u>Year</u>	<u>Exports</u>	<u>Imports</u>
1965	40.9	83.8
1970	108.8	124.8
1974	261.0	395.8
1977	316.5	442.2
1978 ¹	457.6	496.9

Most of the trade shown above is with the U.S. For a variety of reasons which we shall discuss later, the balance of these paper products has always been adverse. Somehow, we have found it difficult to supply our own needs of paper products. We note, however, that should the present favourable exchange rate persist, the imbalance might yet be redressed.²

¹ Estimate, CPPA/79

² For trends in imports as a percentage of Canadian consumption by select products, see Table 18(a), p. 59.

Source: CPPA/79

Factors Affecting Consumption of Paper and Paperboard

Before we turn to examine world production of the major pulp and paper products (production being close to consumption levels), we want to recall briefly the main forces acting on demand in the longer and shorter runs.

The demand for paper, and especially for pulps, is derived demand. All these products depend ultimately on the level of per capita income and the rise in real per capita national income. Moreover, various paper and paperboard products respond somewhat differently to income and population changes, income above a certain level, for example, having little impact on demand and changes in demography having considerable impact on certain grades of paper (especially in the education field).

On average, the demand for various paper products is said to be quite elastic with respect to low income levels that are rising.¹ It has been estimated that in this situation elasticity reaches its maximum at 2.5 to 3 times the increase in real per capita income, with each product having its own particular elasticity of consumption. Obviously, an income increase above a given income level will in the long run equal one; that is, an increase of one percent in real income produces only a one percent increase in consumption. Still higher incomes will produce zero change in consumption (despite maximum waste).

It will also be appreciated that when the national income happens to bend downward, some paper products will show a more precipitous decline than others and greater than the drop in per capita real income.

The United States, having led the way in per capita income, also lead the way in per capita consumption of paper and paperboard. Canada follows, as usual, at a respectful distance; then Europe, Japan, etc. It should be noted

¹Roger Hayter, *An Examination of Growth Patterns and Locational Behaviour of Multi-Plant Forest Product Corporations in B.C.*, 1973, Washington.

that because the third level income countries experience a modest real income expansion, the consumption of paper and paperboard products in these countries is rising considerably faster than their real income.

As may be observed in Table 20, per capita consumption in Canada has been rising at a fairly brisk pace. Total expansion, averaged for all the paper groups, rose 73%. Per capita expansion took place in the U.S. as well, but less noticeably, their per capita real income being higher. On examination, we noted that in 1960-62, U.S. annual consumption was estimated¹ at 210 tons per 1,000 population; Canada's consumption was 138. Some 12 years later, the U.S. consumption had increased to 284, but Canada's consumption increased faster to 208.² That is, in the early 1960s, Canada consumed about 66% as much paper products as the U.S.; in 1974 that gap narrowed to 73%.

Table 20

Expansion of Consumption of Paper and Paperboard
Pounds Per Capita, 1955-74

Newsprint	44.0%
Printing & Writing Paper	89.5%
Tissue & Sanitary	130.0%
Wrapping Paper	54.1%
Paperboard, total	83.3%
Building Paper	63.4%
Containerboard (1960-74)	90.4%
Total all groups	73.0%
(CPPA/77)	

¹Roger Hayter

²Calculated from CPPA 1977.

World Production and Exports

The world demand for paper and paper products has increased more or less in line with the growth in world GNP (real) which advanced rapidly after 1950. In the following two tables, 21 and 22, growth and distribution of pulp and newsprint production are shown. Table 21 indicates that world demand for pulp tripled between 1950 and 1970 and so did the tonnage exported.

It will be noted from Table 21 that while Canada's share in pulp production has declined, we still contribute about 15% to 16% (slump in 1975). We note also that Canada and Scandinavia share about the same total amount. One observes also that Japan and the "others" are beginning to assume a larger share of total production.

As noted, Canada's share of total world exports remains very high,¹ while the Scandinavians are losing ground, partly because they are concentrating more on high value added paper products. One observes the impressive gains made by the newer pulp producers and exporters.

Not surprisingly, three-quarters of all our pulp exports was consumed by our neighbour in 1964. That declined to 55% in 1974,² in part owing to our expansion into sulphate pulp, a major portion of which is sold in Europe. One notes also that the share Japan takes of our pulp (and chips from B.C.) has doubled.

¹Most major producers and consumers tend to concentrate on paper products, those which produce the greatest value added return on timber resources. Certain factors, which we hope to examine, have conspired to channel us into pulp and newsprint.

²About 4 million tons to the U.S. which amounted to only some 8% of American pulp production.

Table 21World Pulp Production
(000T)

	<u>1950</u>	<u>%</u>	<u>1960</u>	<u>%</u>	<u>1970</u>	<u>%</u>	<u>1975</u>	<u>%</u>
Total	38,164		65,675		115,277		117,833	
Canada	8,473	22	11,461	17	18,308	16	16,659	14
U.S.A.	14,849	39	25,316	38	42,216	37	43,248	37
Scandinavia	7,003	18	12,076	18	19,526	17	17,566	15
Japan	825	2	3,884	6	9,695	8	9,479	8
Others	7,014	19	12,939	20	25,532	22	31,241	26

World Exports of Pulp
(000T)

Total	6,281		10,728		18,395		15,953	
Canada	1,846	30	2,601	24	5,581	30	5,565	35
Scandinavia	4,071	65	6,864	64	7,511	41	5,205	33
Others	364	5	1,263	12	5,303	29	5,183	32

(CPPA/77)

Destination of Canada's Pulp Exports

	<u>U.S.A.</u>	<u>Europe</u>	<u>Japan</u>	<u>Others</u>
1964	77%	7%	5%	11%
1974	55%	22%	10%	13%

Table 22World Newsprint Production
(000T)

	<u>1950</u>	<u>%</u>	<u>1960</u>	<u>%</u>	<u>1970</u>	<u>%</u>	<u>1975</u>	<u>%</u>
Total	9,535		14,957		22,784		23,703	
Canada	5,279	55	6,739	45	8,719	38	8,907	38
U.S.A.	1,015	11	2,038	14	3,464	15	3,686	16
Scandinavia	993	10	1,632	11	2,938	13	2,843	12
Japan	145	2	810	5	2,113	9	2,597	11
Others	2,123	22	3,788	25	5,550	25	5,670	24

World Exports of Newsprint
(000T)

Total	6,054		8,233		11,433		11,242	
Canada	4,956	82	6,265	76	7,988	70	7,818	70
Scandinavia	790	13	1,288	16	2,407	21	2,284	20
Others	308	5	680	8	999	9	1,140	10

Destination of Canada's Newsprint Exports

	<u>U.S.A.</u>	<u>U.K.</u>	<u>Latin America</u>	<u>Others</u>
1964	84%	7%	4%	5%
1974	80%	6%	7%	7%

Calculated from CPPA/77 Data

In Table 22, showing world production and export as well as country distribution, we note that the demand for newsprint has not expanded as rapidly as the demand for pulp, an understandable development in view of the increasing uses being made of pulp to produce other paper products. We note that while Canada's share in the total production of newsprint is declining, we remain the dominant producer. We shall examine this question at a later stage. We note further that we are gradually being outpaced by the U.S., although it is still producing only 30% of its own newsprint needs. Scandinavia and Japan are also expanding their capacity, although the former seem to have reached their physical (timber) limit for the foreseeable future.

As will be noted in the export table, while Canada is steadily losing ground in the total, it is doing so from a very high export level. Canada is still supplying 70% of the exported newsprint.

The destination of our newsprint exports has changed only marginally in the past decade: some 80% of our exports are being absorbed by the U.S. where we supply over two-thirds of the consumption of newsprint.

Table 23 was added because of the additional statistical information on the production and distribution of "other" paper and paper products. While the amounts and percentages pertain to production and not consumption, they nevertheless indicate a country's priorities and its ability to achieve those priorities.

It seems rather obvious that if a country is to maximize its raw material, timber, into woodpulp, it ought to produce a maximum amount of fine paper, wrapping paper, printing and specialty papers, etc. The production of these yields superior values of value added and consequently optimizes the

Table 23World Pulp and Paper Production
(000T)

	Wood Pulp	%	Newsprint	%	Other Paper and Board	%
Canada	19,214	15	8,661	38	4,378	3
U.S.A.	43,776	36	2,924	13	49,215	38
E.E.C.	5,826	5	1,685	7	21,836	17
Scand.	18,589	15	2,948	13	9,506	7
Japan	10,017	8	2,237	10	13,412	10
U.S.S.R.	8,182	7	1,334	6	6,862	5
Other	14,461	12	3,143	14	24,297	19

Source: FAO (UNO) 1972

spreadout effects in terms of employment and income. While we do not possess the value added for each of these products, we are able to approximate this by calculating the tonnage value for each which will support the claim.

For example, while the average value of a ton of newsprint was \$192 in 1974 (all these are average values, selling or export prices), a select number of other papers showed the following tonnage values: printing and specialty papers, \$259; sanitary paper, \$398; book and printing papers, \$492; and fine paper, \$558. All things considered, it makes good economic sense for a country to buy pulp(s), mechanical at \$118, sulphate at \$264 and sulphite at \$287, in order to produce various paper products ranging in value from \$350 to \$600. Obviously, where this is feasible, the gains of producing them rather than importing them is considerable, particularly in terms of foreign exchange gains; even preferable if the country is able to export such paper products. We shall examine later why Canada has found it so difficult to crack this market and why a part of our paper and paperboard industry may be in trouble.

While Canada expanded its output of pulp and paper from some 15 million tons in 1950 to over 36 million tons, or by 140% by 1974, employment, as Table 24 indicates, increased from 52,000 to 86,000, or just over 65%, less than half the tonnage increase. As an estimate this would suggest that productivity expanded considerably during the period. An approximate support for this derives from calculating tonnage (pulp and paper) per man-year of the two terminal years. Tonnage per man-year amounted to 288 in 1950 and 420 in 1974. That is, on average, an employee produced 288 tons with the tools available in 1950; in 1974 with (no doubt) improved tools, he produced 420 tons. This suggests a productivity increase of almost 2% per year.

TABLE 24

EMPLOYMENT, WAGES AND SALARIES, 1950-76 and 78

<u>Year</u>	<u>Employees</u>	<u>Wages Salaries (000)</u>	<u>Wages & Salaries Per Employee</u>	<u>% Annual Increase</u>	<u>Constant</u>
				Current \$	\$
1950	52,343	\$ 169,247	\$ 3,233		
1951	57,291	213,170	3,721	15.1	6.1
1952	57,803	225,353	3,899	4.8	6.8
1953	58,194	235,742	4,051	3.9	3.9
1954	60,837	252,598	4,152	2.5	2.5
1955	62,205	265,298	4,265	2.7	2.7
1956	65,985	297,572	4,510	5.7	3.7
1957	66,067	307,990	4,662	3.2	1.2
1958	64,199	307,872	4,796	2.9	0.9
1959	65,162	322,936	4,956	3.3	2.3
1960	65,772	345,093	5,247	5.9	4.9
1961	63,789	338,968	5,314	1.3	1.3
1962	64,599	354,199	5,483	3.2	2.2
1963	65,049	364,512	5,604	2.2	0.2
1964	67,729	394,136	5,819	3.8	1.8
1965	69,897	423,732	6,062	4.2	2.2
1966	73,501	486,249	6,616	9.1	6.1
1967	73,983	516,724	6,984	5.6	2.6
1968	73,498	552,162	7,513	7.6	3.6
1969	75,427	611,591	8,108	7.9	3.9
1970	80,371	701,395	8,727	7.4	6.4
1971	79,397	745,608	9,391	7.6	3.6
1972	78,969	808,869	10,243	9.1	5.1
1973	80,085	884,242	11,041	7.8	0.8
1974	86,203	1,097,098	12,727	15.3	5.3
1975	84,046	1,091,675	12,989	2.1	6.1
1976	86,995	1,415,884	16,275	11.3	6.3
1978 ¹	85,089	1,722,321	20,240	12.2	
				Average	6.0
					3.1

¹ Estimated, CPPA 1979

Source: CPPA 1978

The upward movement in prices (consumer and other) plus expansion and improvements in productivity per man-hour would account for most of the increase shown in the wages and salaries that reached a total of some \$1 billion by 1974. The same factors enabled a worker, on average, to increase his annual income from \$3,200 in 1950 to about \$13,000 in 1974.¹ The table also shows that the average annual increase over the period, in current dollars, was 6% and in constant dollars, 3%.

Despite a most impressive expansion in both volume and value of pulp and paper production, and equally impressive expansion of these as trading goods and hence export earnings, both have shown a steady slippage over the years when compared with growth of GNP and total value of exports.

Gross Production Related to GNP²

<u>1950-59</u>	<u>1960-69</u>	<u>1970-76</u>
4.8%	3.96%	3.26%

Gross production of pulp and paper ranged from about \$1 billion to about \$1.5 billion during the first period (1950-59) and GNP between \$18 billion and \$35 billion -- average for the period, as shown above, 4.8%. In the second period, gross production of pulp and paper ranged between \$1.5 billion and \$2.8 billion, GNP between \$35 billion and \$80 billion, a ratio of 3.96%. In the 1970-76 period, pulp and paper production value ranged from \$2.8 and \$5.7 billion and GNP between \$80 billion and \$144 billion, a ratio of 3.26%.

¹The unusually rapid increase in product prices, value of shipments and profits, and some constructive collective bargaining, boosted the wage and salary bill to an estimated \$1.7 billion, about \$20,000 per employee in 1978 (about \$18,000-plus for the production worker). CPPA/79

²Each period averaged.

Similarly, the export value of pulp and paper as a percentage of total domestic exports, averaged for the same periods, shows the following decline:

<u>1950-59</u>	<u>1960-69</u>	<u>1970-76</u> ¹
22.23	16.94	11.86

As will be noted, while we once earned over 20 cents of the export dollar, we are now down to about 11 cents.

One reason for this slippage, in both comparisons, may be that Canada expanded its newsprint industry very rapidly at an early stage in order to supply some three quarters of the U.S. newsprint consumption. Since the early post-war period, we have not been competitively strong enough to maintain that percentage nor have we been able to expand elsewhere to any marked extent. These factors have made newsprint expand less than other products within the industry and less than GNP and the expansion of total exports.

Table 25 shows the value of production per employee and wages and salaries as a percentage of production for a select number of years.

As one would expect, with value of production rising faster than employment, owing to rising prices, the ratio kept rising; it rose especially sharply in the 1972-74 period when product prices made a significant jump.

Wages and salaries as a percentage of value of production tends to form a stable ratio over time. However, as will be observed, the wage and salary component failed to keep pace with the sharply rising value of production in the 1973-74 period, causing the ratio to drop markedly. As will be noted, this situation was rectified by 1977.

¹ Declined to 10.85 in 1978.

TABLE 25

	<u>Value of Prod'n (1)</u> <u>per Employee</u>	<u>Wages as % (2)</u> <u>of Value of Prod'n</u>
1961	30.6	16.6
1965	36.3	16.0
1969	44.5	17.6
1972	50.7	19.2
1974	86.4	14.0
1977	102.2	17.0

Source: Statistics Canada Cat. 36-204 Annual

(1) Value added, cost of materials and cost of fuel

(2) Production workers

Statistics Canada

Table 26 indicates the input values per employee in the case of three components, and output values per employee for two. These have been calculated for three select years.

Among other things, these resulting values confirm the assertion of instability of the industry. We note, for example, that all values, except the wage component, increased more rapidly between 1972 and 1974 than in the six previous years. The wages lagged considerably while the value of shipments doubled. More recent data (1977) suggest that, apart from the first item, cost of fuel and electricity, the above values are advancing at a more equal pace: the fuel item has been accelerating since 1972, a trend that is likely to continue for a number of years. (See Table 26)

INDUSTRY CHARACTERISTICS

The Foreign Ownership Function

The American presence in the pulp, paper and allied industries in Canada is of long standing.¹ One way of regarding their early investment efforts in these industries is to say that American capital was the main thrust in the development of the Canadian paper industries. Another way of looking at it, possibly more realistic, is to suggest that the American demand for newsprint, in particular, far exceeded their ability to generate enough of their own capacity and to find readily available timber resources. One look across the border offered the solution -- plenty of timber and also plenty of less expensive labour. Consequently, American capital entered in massive amounts to establish

¹By 1922, 75% of the total capital invested in pulp and paper manufacturing in Canada had come from the U.S. C. Southworth, Political Economy, Vol. 30, 1922.

TABLE 26

COST OF FUEL AND COST OF MATERIALS, PER EMPLOYEE;
 VALUE OF SHIPMENTS AND VALUE ADDED, PER EMPLOYEE;
WAGES AND SALARIES, PER EMPLOYEE

(Dollars)

	<u>1966</u>	<u>1972</u>	<u>% Increase</u>	<u>1974</u>	<u>% Increase</u>
Cost of fuel and electricity	2,200	3,100	40	4,600	48.4
Cost of materials	14,000	19,000	35.7	27,000	42.1
Value of shipments	30,000	40,000	33.3	66,000	65.0
Value added	15,000	17,000	13.3	36,000	111.8
Wages and salaries	6,600	10,200	54.5	12,700	25.1

Calculated from CPPA/77 and from Statistics Canada

pulp and paper mills that would supplement and, in some cases, complement their own domestic productive facilities.

The market relationship between the Canadian and American pulp and paper industries has been referred to from time to time as Canada being the marginal supplier and that most of our ills stem from that contrived relationship. We would suggest that such a concept is somewhat of an exaggeration. Canada supplied for a great many years three quarters of the U.S. newsprint consumption. There is surely nothing marginal about that. The marginal concept may pertain to certain pulps and other paper products that from time to time tend to act as fillers in the U.S. markets (partly by way of branch plant operations). Many large U.S. integrated producers are almost self-sufficient in pulp. Small variation in demand for their various paper and paperboard products will cause wide swings in their need for Canadian pulps. This can be a problem.

In any case, it would appear useful to record the foreign ownership function, both the U.S. and others. The information is collected and readily available from Statistics Canada.

Tables 27 and 28 provide information about the distribution of ownership in the paper and allied industries held by non-Canadians at the national and provincial levels. Table 27 shows the national division and Table 28 the provincial. The percentages pertain to the share held by the total external group, the share being measured in terms of employment, value of shipments and value added as a proportion of totals. As might be expected, Canada being an economic appendix of the U.S., most of the total foreign ownership is held by that country.

TABLE 27
FOREIGN OWNERSHIP - NATIONAL , 1972

<u>Paper and Allied</u>								
	<u>Establs</u>	<u>%</u>	<u>Employment</u> <u>(000)</u>	<u>%</u>	<u>Shipments</u> <u>Mill</u>	<u>%</u>	<u>Value Added</u> <u>Mill</u>	<u>%</u>
U.S.A.	146		38.6		1,548.2		673	
Other foreign	59		18.8		636.5		275	
Total foreign	205	31	57.4	48	2,184.7	49	948	48
All estbls.	654		120.8		4,414.0		1,962	
<u>Pulp and Paper</u>								
U.S.A.	53		26.1		1,134.2		478	
Other foreign	17		11.8		411.4		172.0	
Total	70	50	37.9	48	1,445.6	49	650	47
All estbls.	141		79.0		3,127.8		1,380	
<u>Corrugated Box</u>								
Foreign	18	24	3.7	37	137.4	40	54.2	40
All estbls.	74		10.1		345.3		134.8	
<u>Paper and Plastic Bag</u>								
U.S.A.	14		1,860		70.9		26.2	
Other foreign	12		1,300		44.5		19.4	
Total foreign	26	32	3,160	51	115.4	54	45.6	53
All estbls.	82		6,190		210.9		85.7	
<u>Miscellaneous Paper Converters</u>								
U.S.A.	51		6,290		184.8		103.9	
Other Foreign	16		2,530		76.3		38.3	
Total Foreign	67	29	8,820	54	261.1	58	142.2	62
All estbls.	213		16,170		453.0		230.7	

Source: Statistics Canada Cat. 31-401 Biennial

TABLE 28Foreign Ownership - Provinces , 1972
(by percentages only)Paper and Allied

	<u>Establish</u>	<u>Employment</u>	<u>Value Ships.</u>	<u>Value Added</u>
	<u>Nova Scotia</u>			
	54%	77%	86%	83%
	<u>New Brunswick</u>			
	Not Divided			
	<u>Quebec</u>			
U.S.A.	17%	27%	30%	30%
Total foreign	23%	40%	43%	42%
	<u>Ontario</u>			
U.S.A.	23%	35%	37%	38%
Total foreign	32%	51%	54%	54%
	<u>Manitoba</u>			
U.S.A.	32%	29%	32%	33%
Total foreign	52%	54%	54%	46%
	<u>Saskatchewan</u>			
	No Data			
	<u>Alberta</u>			
Total foreign	32%	55%	60%	62%
	<u>British Columbia</u>			
U.S.A.	32%	38%	39%	37%
Total foreign	40%	49%	50%	45%

National Picture

As will be noted in Table 27, almost one half of the paper and allied industries is in foreign hands when measured in terms of shipments and value added. Of the total foreign share held, the U.S. holds 70% of the value added.

In the case of the pulp and paper group, the foreign share again shows roughly one half, in this case including the number of establishments. The U.S. share in the total foreign value added is 74%.

The foreign share of total value of shipments and value added amounts to 40% in the case of the corrugated box group. Non-Canadians hold over 50% of the paper and plastic bag industry. Rather surprising is the majority share held by foreigners in the miscellaneous converter group. The foreign owners seem to hold most of the larger establishments because, although they own only 29% of the 213 establishments in this category, they hold 54% of employment, 58% of value of shipments and 62% of value added. As might be expected, the U.S. claims over 70% of the foreign holdings.

Table 28 provides information about the degree of ownership in paper and allied industries by provinces. Where information is available, U.S. share is indicated.

As might be observed, most of the industry in Nova Scotia is foreign owned. In the province of Quebec, the U.S. holds about 30% of the industry and total foreign ownership amounts to over 40%.

The foreign group owns more of the industry in Ontario. The U.S. owns between 35% and 40% and the total foreign group holds more than half of the industry.

Also, as will be noted, over half of the industry in Manitoba is foreign held and almost two thirds of the Alberta industry. In British Columbia, the U.S. holds nearly 40% and the total foreign group, close to 50%.

We may draw the conclusion, then, from these statistics that with some exception by province (i.e. Quebec) and by sub-groups within the paper and allied industries, Canadians do not quite own half of this important industry.

There are advantages to Canada in permitting foreigners to establish branch plants for producing pulp and paper products, but also many disadvantages.

On the positive side, allowing an inflow of capital permits a facility to be established earlier than if we had to rely on our own savings. The new branch plant provides employment, certain amount of income and the paying of taxes.

On the negative side, the product or products of the branch plant may just be providing fillers to the mother corporation and so be subject to wide employment fluctuations. The major policy formulations are usually shaped abroad; among other things, such a branch plant is not likely to be interested (possibly not even permitted) in co-operating in an industrial strategy. Branch firms do not develop their own research resource, which is carried out at headquarters. Like other foreign-owned facilities and resources, branch pulp and paper plants contribute to the harmful draininage of wealth out of Canada.

Industry Concentration

Most industries, manufacturing or otherwise, are characterized by having a few firms or enterprises that in terms of employment, value shipment or value added account for a relatively large share of the industry's market; the greater the share a few firms have, the greater their market power, from which derives their ability to control prices.

Statistics Canada¹ has measured the industry concentration by showing the relative importance of the leading four, eight, 12, 50 enterprises of an industry. The following is the information on concentration in the pulp and paper industry (see Tables 29(a) and (b)).

In 1972, this industry had 65 enterprises consisting of 141 establishments. Four of the leading firms, which comprised 35 establishments, accounted for 34.5% of total value of shipments (and 36.3% of value added and 34.5% of employment). Eight of the leading enterprises had 56 of the establishments and accounted for 52.5% of total value shipments (and 55.1% of value added and 54.7% of total employment). In other words, eight of the 65 enterprises accounted for over one half of the output value and employment. Twelve accounted for 64.3%. We must conclude from these figures that a relatively small number of firms in the pulp and paper industry possess significant market power, but not monopoly power.

In the case of the Folding Carton and Set-up Manufacturers, which have 98 enterprises (1972) with 112 establishments, it was found that four enterprises with 13 establishments controlled 46.1% of the market; eight firms with 19 establishments accounted for 59.4% of the total value of shipments.

¹Statistics Canada, Cat. 31-402 Biennial.

Corrugated Box Manufacturers demonstrated an even greater concentration. The industry was made up of 37 enterprises and 74 establishments. However, the four leading firms accounted for 54.4% of the total value shipments and eight of the leading firms claimed over 80%.

The picture of the paper and plastic bag manufacturers was as follows: Four of the leading firms, of the 63 enterprises, with 17 establishments, had 40.6% of the total value of shipments and the eight leading firms, 59%.

The miscellaneous paper converter group consisting of 187 enterprises with 231 establishments showed that in 1972, four of the group's leading firms with 24 establishments accounted for 33.5%; 12 of the group's leading enterprises accounted for well over half of the group's value of shipments (54.9%, about the same for value added, 53.6%, but only 44.5% of total employment).

Industry Concentration - Comparison 1968, 1972

Tables 29(a) and (b) demonstrate the amount of industry concentration that exists in the pulp and paper industry, in three paper manufacturers and in the converter group. The information is for 1968 and 1972. The degree of concentration is indicated by noting what share the four and eight leading firms control of the total industry shipment for each group. The total number of firms and establishments is shown in brackets.

Table 29(b) mirrors the same information, in this case showing the concentration of eight firms.

TABLE 29(a)

The Percentage of Value of Shipments Held by Four Firms
in the Industry Groups Below, 1968 and 1972

	<u>1968</u>			<u>1972</u>		
Miscellaneous Converters	4(180)	15(214)	29.9%	4(187)	24(231)	33.5%
Paper and Plastic Bag	4(64)	17(88)	40.5%	4(63)	17(82)	40.6%
Corrugated Bag	4(33)	24(62)	58.5%	4(37)	27(74)	54.4%
Folding Cartons	4(105)	12(117)	42.6%	4(98)	13(112)	46.1%
Pulp and Paper	4(60)	33(137)	33.7%	4(65)	35(141)	34.5%

TABLE 29(b)

The Percentage of Value of Shipments Held by Eight Firms
in the Industry Groups Below, 1968 and 1972

	<u>1968</u>			<u>1972</u>		
Miscellaneous Converters	8(180)	28(214)	41.3%	8(187)	33(231)	45.6%
Paper and Plastic Bag	8(64)	28(88)	61.1%	8(63)	23(82)	59.0%
Corrugated Bag	8(33)	35(62)	83.8%	8(37)	41(74)	80.7%
Folding Cartons	8(105)	18(117)	57.8%	8(98)	19(112)	58.4%
Pulp and Paper	8(60)	56(137)	53.1%	8(65)	56(141)	52.5%

Little account should be taken of the marginal changes indicated from 1968 to 1972. Some of the difference may stem from changes made by Statistics Canada in the enterprises' boundary lines in the two years. Nevertheless, some of the changes indicated in the market concentration may well be legitimate.

One must also recall that while the above concentration values are fairly large, many industries show vastly higher ratios and others much smaller concentration figures. For example, many of the metal industries have high concentration: iron and steel (four leading firms) 78%; steel and pipe, 73%; aluminum rolling, 82%, etc. On the other hand, most textile groups show the leading four with percentages ranging from 10 to 20%.

In any case, our chief concern in the above examples is the extent of market power held by the pulp and paper industry as indicated by the leading four and eight enterprises, both in 1968 and 1972.

The pulp and paper industry has never been particularly notorious for its championing of the classical products market. Free enterprise? Yes. Keen competition? No. The massive amount of capital required per ton of output, the unusually wide cyclical swings in profits, the competitive giants south of the border, are some of the factors that have made the Canadian pulp and paper entrepreneur seasoned against the ideal products market and wary of promoting competition under any conditions. Employers have therefore sought to develop the kind of market policies and pursue the kind of market behaviour (gain some control over prices) which would best protect their profit levels.

In view of the character of the industry and the ensuing market behaviour, it is fair to conclude that the industry has been¹ and continues to

¹See J.A. Guthrie. *The Newsprint Paper Industry*, Cambridge, 1941; also, V.W. Bladen, *Introduction to Political Economy*, Toronto, 1941.

be an ongoing oligopoly (oligopoly - a few firms, not particularly anxious to engage in cut-throat competition).

Horizontal and vertical integration and diversification are techniques long employed by many pulp and paper firms, in part at least, in order to counter the exigencies of foreign markets and to exert control over domestic paper prices.¹ The trend is in the direction of forming more complete enterprises from wood fibre to end product (in fact from wood fibre to a number of end products). This has been discernible for many years in Europe and the U.S. The process leads to bigness and more market power, the objective being to achieve some measure of stability and to become more profitable.

We noted earlier the high degree of market power accumulated by the leading four, eight, etc. firms. Another support indicating the high degree of integration and diversification is suggested by the fact that six large Canadian newsprint firms accounted for 61% of the over 10 million tons of newsprint produced by 22 firms in 1975. More interesting, those six firms produced also a vast variety of paper products. The 1978 Business Directory, Pulp and Paper Canada, shows on examination that one or more of the big six² produced products that come under some 200 of the 280 or more headings of pulp, paper and paperboard products listed in the Directory.

Nevertheless, while this integration is producing some fairly large Canadian pulp and paper enterprises, they do not rank especially high in world

¹Their behaviour has from time to time come to the attention of the Combines Investigation Branch of the Federal Government.

²Abitibi Paper, Canadian International Paper, Consolidated-Bathurst, MacMillan Bloedel, The Price Co., Ontario Paper.

terms. Canada has only six firms that ranked in the top; Abitibi, possibly our largest, ranked 17th¹ (early 1970s)

As one would expect, one finds significant concentration, integration and diversification within the U.S. pulp and paper industry.

A study² suggests that of a very large number of companies (1185³) "a small number account for the majority of the industry".

Industry concentration measured by the share of total held by four, eight, 20 leading firms is shown in the following Table 30.⁴

Table 30

	<u>U.S. Paper-Grade Wood Pulp Capacity</u> (daily tons)	<u>U.S. Paper and Paperboard Capacity</u>
Total U.S. capacity	129,147	164,237
4 firm share	33,703 26.1%	33,716 20.5%
Share of 8	54,040 41.8%	54,786 33.4%
Share of 20	92,882	95,245 58.0%

¹Before Abitibi acquired controlling share of Price Company Ltd.

²Investment Outlook and Related Federal Policies for the Paper Industry, 1976-85. Stanford Research Institute (SRI), January 1977.

³"Spot shortage conditions in 1973-74. The Pulp and Paper Industry Experience", Harbridge House, Boston, Mass./76-1975, 415 pulp mills and 770 paper mills.

⁴SRI, page 145.

The study notes that of the top 20, nearly all produce both bleached and unbleached grades of wood pulp and groundwood pulp. They also produce a range of grades of paper and paperboard and all are converters of paper and paperboard to end products (all but one in lumber). There is also significant dominance of particular grades. For example, the top four producers of sanitary and tissue account for 63% of total capacity; the top eight for 87%. In 1975, the leading four of 27 linerboard producers accounted for 34%; leading eight, for 48%.

All but one of the above leading 20 enterprises are large timber owners, accounting for "a large share of all timberlands held by the forest products industry".

The study concludes its discussion on concentration and integration by offering the following observations: "The strong forest resources, production capacities and market position of the already established major producers of pulp, paper and paperboard in the U.S., together with the very high costs of acquiring timberlands, constructing new production facilities and entering into competitive markets, underscores the fact that the preponderance of the capacity that will be required over the coming decade will be provided by these major producers -- or not at all." Also, "Given this industry structure, the return on investment that will draw the new investment in capacity will be significantly higher than the returns that characterized the industry in the past." (SRI, p. 146)

Productivity Trends

Table 31

Pulp and Paper, Canada, U.S.A.
(Index Numbers, 1949 = 100)

Real Gross Output per Production and Related Worker

	<u>Canada</u>	<u>U.S.</u>
1947	95.6	98.3
1954	106.4	121.9
1961	127.5	168.5
Yearly rate of change, 1947-61	1.6%	3.6%

Despite the many studies of the pulp and paper industry, those perused are strangely silent on the productivity developments; no one appears to have produced a sequel to the Report tabled above. Granted, achieving meaningful results on productivity changes in an industry is difficult because the measurements are so complex. However, even approximate productivity and efficiency trends can prove useful both to employers and unions.

The above statistics purport to show that productivity increases in Canada over the given period were less than half that in the U.S. One would want to believe that Canada's pulp and newsprint firms were as productive and that the lag in Canadian productivity stemmed primarily from firms producing "other" papers. That portion of the Canadian industry has an atomistic market structure: small firms, generally regarded as inefficient.

One finds credible the fact that the U.S., with 12 times the consumer market of "other" paper products, has developed a more rational firm and establishment structure in line with available technology, cost efficiency, and large markets. For example, it was recently pointed out¹ that one U.S. fine

¹Review of the Canadian Forest Industry, I.T. & C., 1978.

paper firm produced as much as our 13 establishments.

While we are not in a position to prove definitely what has happened to productivity in the industry since 1961, the following results cast some light on what may have transpired.

Table 32

Select Productivity Measures; Select Years

	<u>1961</u>	<u>1965</u>	<u>1974</u>
Manhour per ton output	5.58	4.58	3.91
Reduction in number of manhours used per ton on average, 1961-74 - 42.7% (roughly, <u>3.3%</u> a year on average)			
Tons per employee	325.8	367.6	423.4
1961-74 change, 30% - roughly <u>2.4%</u> /year			
Tons per production worker	388.9	436.2	548.2
1961-74 change, 40.9% - 3.1% per year			

Whatever the degree of reliability of the final figures (3.3%, 2.4%, 3.1%) they do indicate a continuing trend of labour being exchanged for capital. One notes particularly the disproportionate increase in the non-production workforce to the total. Over the 13-year period, these increased 35% while the productive group rose by only 24.6%. This shift in the personnel mix appears to go pari-pasu with rising level of technology, also movement toward higher integration.

Various Cost Characteristics

Whether an enterprise is operating profitably depends on a great many things, but primarily on one side of the coin, availability of markets and adequate prices; on the other side of the coin, the ability of management to devise and pursue planned and efficient strategies and to minimize costly errors; but also ability to control external costs as far as possible. Even taxes need not be regarded as immutable, they just appear so.

Comparative Wood Costs, Location and Time

Cost would, of course, matter a great deal less were the pulp and paper industry operating in a closed economy. Because ours happens to be very much open, costs of inputs and getting the products to market play an important role in the state of health of the industry at any one time. While there are now an increasing number of competitors anxious to meet the rising global per capita consumption, the U.S. and Scandinavia pose, for the time being, our most formidable opponents.

As we remarked earlier and shall reiterate, the cost of wood constitutes the single most costly input. It would, therefore, seem paramount that employers seek out the most efficient way of obtaining adequate wood supplies whether this is achieved by their own harvesting or by way of purchase from a state-owned corporation.

Table 33 demonstrates both the cost level and cost spread change over time for a cunit of wood, regionally and to our competitors.

As will be noted, the cost spread for pulpwood across Canada is extremely wide, \$35-\$90 per cunit in 1976. It will be observed also that

TABLE 33

(a) REGIONAL PULP WOOD COSTS, 1971-76
(\$ per cunit)

	<u>1971</u>	<u>1976</u>
B.C. Coast	22	40 - 50
B.C interior (chips)	17	35 - 45
Alberta	26	35 - 40
Ontario	40	60 - 90
Québec	38	50 - 75
N.B.	30	50 - 60
Nfld. (not Lab.)	35	70 - 80
Canada	35	35 - 90
U.S. South	35	45 - 55
Sweden	42	75 - 85
Brazil	NA	25 - 40
Southeast As	NA	35 - 50

(b) AVERAGE COST OF PULPWOOD USED BY PULP AND PAPER MILLS
1974 (\$ per cunit)

	<u>Canada</u>	<u>B.C.</u>	<u>Ont.</u>	<u>Quebec</u>	<u>Other</u>
Roundwood	46.64	38.73	49.44	51.72	43.34
Pulp Chips	36.11	33.94	39.73	47.85	39.29

Statistics Canada

(c) AVERAGE COST OF WOOD USED
(per cunit)

	<u>Roundwood</u>	<u>Residue</u>
1950	\$26.00	\$15.40
1960	30.20	20.48
1970	34.10	24.78
1974	46.44	36.10

the cost increased sharply between 1971 and 1974. Sub-table (b) indicates the average price of roundwood and pulp chips across the country; and (c) shows the average price of roundwood and residue by decades 1950-70 and 1974.

In the main table we observe the comparative wood costs among the three main competitors. One notes that pulpwood is relatively inexpensive in the U.S. and rather more expensive in Sweden - on average, in fact, higher than in Canada. While we must caution against too much reliability on these figures, it is nevertheless clear that Sweden and Canada are producing and consuming more expensive wood inputs than the southern U.S.

Sub-table (c), which shows the average price of roundwood and residue, indicates a sharp increase in both with the residue price increasing considerably faster over the period. Roundwood prices rose on average 78.6% while residue supplies increased by 134.4%. The sharp price increase of residue reflected the shift to chips which were relatively cheap, thus boosting demand.

The following statistics indicate this hefty increase in demand for residue as a percentage of wood used: residue purchase only amount to 2% in 1950, 11.2% in 1960, 26.5% in 1970 and 37.3% in 1974.

Of course, this encouraging shift to less expensive wood inputs in Canada is somewhat misleading. Note Table 34. British Columbia consumed, in fact, 58% of the total wood residue used in 1974. One reason for the low level of residue consumption in Ontario may be scarcity of supplies, or economic unavailability, or lack of integration with sawmills. Moreover, the cost differential, residue and roundwood, is small in Quebec and east. It was still quite large in B.C. and Ontario in 1974. One wonders how long this differential will last in B.C. with Japan and Sweden purchasing so much of our chip supplies.

Table 34Amount Consumed and Distribution of Total Pulpwood and of Residue
Canada and Regions, 1974 (Cunits)

	<u>Total</u>	<u>%</u>	<u>Residue</u>	<u>%</u>
Canada	28,601	100	10,701	100
Atlantic	4,667	16	809	8
Quebec	7,968	28	2,060	19
Ontario	5,035	18	992	9
Prairies	1,518	5	598	6
B.C.	9,475	33	6,242	58

Statistics Canada: Pulp and Paper Mills/74

Comparative Manufacturing Costs¹

Tables 35(a) and (b) provide the distribution of various manufacturing costs in the production of bleached kraft pulp and newsprint and in three distinct mill situations. The column headed "Canada, 10-year old" in each case was added to demonstrate that while productivity in older mills is likely to be lower, capital charges are also likely to be lower; as a result, the one may offset the other and so enable the older mill to compete. No doubt this factor induces some employers to neglect modernizing their mills.

One notes from both tables that wood costs, which constitute a large input item, are lower in the southern U.S. than in eastern Canada.

Labour cost is marginally higher in Canada, largely the result of lower productivity; transportation, a relatively small cost item, shows a higher share in Canada.

¹"The Canadian Forest Product Industry", Forest Products Group Resource Industries and Construction Branch, Industry Trade and Commerce, 1976.

TABLE 35(a)

DISTRIBUTION OF COSTS AND PROFITS
FOR SOFTWOOD BLEACHED KRAFT PULP, 1976

	U.S. South <u>New Mill</u>	<u>Eastern Canada</u> New Mill 10-year old	
Selling Price (third quarter 1976)	100 %	100 %	100 %
Manufacturing Costs			
Wood	20.8	31.9	31.9
Labour (incl. fringe)	6.4	6.9	7.2
Energy	7.8	6.4	7.0
Other	<u>12.5</u>	<u>13.9</u>	<u>14.4</u>
Sub-Total	47.5	59.1	60.5
Overhead, Selling & Admin.	4.4	5.0	5.0
Transportation	4.2	8.3	8.3
Capital Related	23.9	29.2	6.7
Gross Before Tax	20.0	(1.6)	19.5

TABLE 35(b)

DISTRIBUTION OF COSTS AND PROFITS OF NEWSPRINT, 1976

	U.S. South <u>New Mill</u>	<u>Eastern Canada</u> New Mill 10-year old	
Selling Price (third quarter 1976)	100	100	100
Manufacturing Costs			
Wood	14.0	24.6	24.6
Purchased chemical pulp	12.6	13.0	13.0
Labour (incl. fringe)	7.4	9.1	9.8
Energy	15.8	14.0	13.3
Other	<u>5.6</u>	<u>7.0</u>	<u>7.3</u>
Sub-Total	55.4	67.7	68.0
Overhead, Selling & Admin.	5.6	6.3	6.3
Transportation	5.3	12.3	12.3
Capital Related	20.4	24.9	8.1
Gross Before Tax	13.3	(11.2)	5.3

The servicing of capital is a relatively high cost item; no reason has been offered for its being higher in Canada. On this item, the old mill has an advantage. Energy, of which the pulp and paper industry is a massive consumer, is a major cost item and, as one might expect, less expensive in Canada than in the southern U.S., although Canada is now feverishly attempting to remove that advantage.

Table 36 provides information about the after-tax profits for the period 1965-75. The upper half of the table shows profits as a percentage of shareholders' equity in the case of the paper and allied group as well as for total manufacturing. The lower half indicates the profits as a percentage of the capital employed in the case of the pulp and paper group and total manufacturing.

It will be appreciated that these calculated percentages must be interpreted with some caution. For example, the equation that produces net profits is a complex and varying one. Similarly, the two denominators shared equity and capital employed are both fluid quantities that may fluctuate over time.

Nevertheless, if a measure of consistency is employed over time to arrive at the basic data, the resulting percentages depicting the profitability of one industry can be useful. Such percentages weaken and become increasingly less useful when several industries are combined.

With that caution in mind, we note in the upper part of the table that the after-tax profits as a percentage of shareholders' equity averaged 8.1 for the period as a whole; also, that in five of the years profits rose well above the average.

TABLE 36AFTER-TAX PROFITS AS A % OF SHAREHOLDERS EQUITY

<u>Year</u>	<u>Paper & Allied Industries</u>	<u>Total Canadian Manufacturing</u>
1965	10.5	11.1
1966	11.6	11.0
1967	6.1	9.2
1968	5.8	10.0
1969	7.8	10.2
1970	4.3	7.4
1971	3.0	9.5
1972	2.0	11.1
1973	8.5	14.5
1974	20.5	16.7
1975	9.1	13.5

Period Average

AFTER-TAX PROFITS AS A % OF CAPITAL EMPLOYED

<u>Year</u>	<u>Pulp & Paper</u>	<u>Total All Mfg.</u>
1965	7.1	8.0
1966	7.4	7.7
1967	3.6	6.2
1968	3.4	6.7
1969	4.4	6.9
1970	2.4	4.9
1971	1.5	6.4
1972	1.1	7.5
1973	4.7	10.0
1974	11.4	11.8
1975	5.2	9.4
Average	4.7	7.8

Source: Statistics Canada

Similarly, the after-tax profits as a percentage of capital employed averaged 4.7, again roughly the same picture emerges as in the previous.

Indications are that the annual percentages for 1978 and 1979 will be significantly higher than the above averages. Profits in the woods industries rose markedly in 1978 and, according to Statistics Canada, they jumped a further 65% in the first three quarters of 1979 above the corresponding 1978 period.

Both of the percentage columns reveal the marked instability of these groups of industries. The boom and bust feature has been an intrinsic historical characteristic. We accept that there are external factors that can contribute to this instability such as sudden shifting demand-supply-price movements. But we also believe that other factors contribute and that these are both significant and manageable.

First, we shall observe that the paper and allied industries have never, singly or in combination, felt the steadying hand of long term planning. No observable attempt has been made, despite the often severe swings in output, employment and profits, to establish goals and objectives and to fashion the necessary industrial strategies.

Our second observation is that while we agree that some employers of these industries are tolerably efficient, others are not and that these employers have contributed significantly, over time, to the generally poor productivity performance of the industries and to their recurring instability.

Appropriate actions on both of these fronts would help reduce instability and improve the long-term profit picture.

Pollution Abatement Costs

We agree with most of those who are anxious to clean up old sources of pollution and to prevent new ones from forming. These objectives must be pursued according to sound criteria -- the technological capability available, the economic feasibility of achieving and retaining clean air and water and the pragmatic trade-off between a clean environment and other human consequences that may ensue in these processes.

The pollution abatement costs are very high in cleaning up the old chemical sulphite pulp industry. On the other hand, while the technological and cost problems are worrisome in the case of old mills, these are much less so in the case of a new mill where the pollution technology is built in. Alleged costs in such instances tend to be exaggerated because gross rather than net costs are used. One ought not to forget that a great deal of costly raw materials is saved in both examples. Mr. Waldichuk, a scientist, said in 1962:

"The objectives in prevention of pulp mill pollution are in no way incompatible with the principle of good housekeeping and economic operation of the mill. All materials which go down the sewer were purchased originally and if economic recovery is possible, they constitute a gain for the pulp industry as well as for conservation of aquatic resources."¹

Canada has spent almost \$500 million on cleaning up and preventing pollution caused by chemical pulp mills. The U.S. has spent almost \$3 billion. The following data are estimates of these expenditures in each country.

¹National Research Council Report, 1973. "The effect of pulp and paper wastes, with particular attention to fish and bioassay procedures for assessment of harmful effects".

Capital Expenditures on Pollution Abatement Until 1975 - millions of dollars¹

	<u>U.S.</u>	<u>Canada</u>
Water	1598 (1967-75)	400 (1959-75)
Air	<u>1282</u> (1967-75)	<u>93</u> (1964-75)
	2880	493
Expenditure per ton per year	\$56	\$20

The comparison suggests that Canada has been dragging its feet, especially with respect to cleaning up the air. If our expenditures on air were commensurate with air to water expenditures in the U.S., we would have spent \$321 million instead of just \$93 million. That would have almost doubled the \$20 per ton per year. In other words, our expenditures on water may have been respectable. In contrast, air pollution on which we spend very little is getting worse.

Another way of representing these expenditures is to indicate their percentage to total capital investment per annum.

Pollution Abatement Expenditures in the U.S. Pulp, Paper and Paperboard Industries

<u>Year</u>	<u>\$Millions</u>	<u>Share of total capital expenditures²</u>
1970	187	14%
1971	203	17
1972	339	24
1973	351	19
1974	523	21
1975	<u>644</u>	22
	\$2,247	

¹Industry, Trade and Commerce report.

²Stanford Research Institute.

Unfortunately, Canada does not produce comparable figures. Estimated expenditure values on mill facilities and on pollution abatement for 1975 and 1976 suggest an average percentage of pollution abatement to total capital expenditures of some 12-16%. A capital expenditures forecast for 1977, including estimated pollution abatement expenditures declared or under way suggests a percentage of some 13%. Neither of these estimates is secure.

A report in the Financial Post in 1976 proposed that the possible expenditure on pollution abatement in line with regulations may exceed \$500 million by 1985, or "about 15% to 20% of total capitalization". In any case, the objections that emerged from a survey of a number of firms (including Canadians) conducted by the Stanford Research Institute, 1977, brought forth three main complaints: that the heavy expenditures on pollution abatement within too short a time frame is unrealistic; that it has led to an acceleration of closure and partial closures of chemical sulphite mills; and that expenditures on pollution abatement have diverted monies away from investment in new mill capacity.

Our experience with these first two points is that authorities have sometimes shown more concern with achieving ideal pollution standards than with establishing comprehensive and humane programs that would cushion the adverse employment and income effects on workers and communities when chemical mills were forced to close down. We support the objective of cleaning up chemical pollution; we object, however, to any procedure that transfers a disproportionate share of the costs of doing so on to the workers in the form of loss of employment and income.

In the third point, there is no evidence that either country has run short of chemical pulp or other pulps because of the industry's investment

in pollution abatement. One must recall that when all competitors internalize the pollution abatement costs (this is just another cost item), their competitive positions remain largely unaltered. Very heavy pollution abatement costs might increase product prices sufficiently to reduce demand, in part by inviting substitution.

The last pollution abatement information in the following table shows estimates of total additional expenditures to meet Canadian federal requirements and similar additions to meet 1977 U.S. requirements. Last columns indicate estimates or guesstimates of total pollution abatement expenditures so far and until standards are met. In terms of this information, it would appear that Canada may be catching up. That would not be surprising if the two pursue similar standards and roughly the same time objectives.

Government Expenditures - Air and Water Pollution Abatement - (\$millions)¹

	Estimated Additional US Expenditures to Meet 1977 Require- ments	Estimated Additional Cdn. Expenditures to Meet Federal Require- ments	Total Expendi- tures past and future <u>U.S.</u>	<u>Canada</u>
Water	502	811	\$1831	\$1187
Air	<u>342</u>	<u>162</u>	<u>1495</u>	<u>251</u>
Total	\$844	\$973	\$3326	\$1438
Annual \$ per ton capacity of wood pulp	\$17	\$ 40	\$ 65	\$ 58

We should warn that these pollution abatement figures are not particularly secure. The U.S. information is thought to be reasonably reliable but that cannot be said for the Canadian information. One of our difficulties

¹Industry, Trade and Commerce Report, 1976: from NCASI Report No. 75-02 June 1975. Environment Canada EPS 3-WP-75-6 December 1975.

lies in the fact that while water legislation enables enforcement of standards and hence useful attending information, we have no such legislation for pollution of the air and consequently information is less useful. The Canadian industry provides a great deal of information on pollution abatement costs but no aggregate annual figures have been found. It may be unfair to suggest that lack of precise pollution abatement information has an advantage: it permits greater exaggeration about the heavy cost burden.

PART III

INDUSTRY GOALS, OBJECTIVES AND STRATEGIES

It has become fashionable in recent years for politicians and even some of the fierce supporters of the free market forces to bandy about the phrase "industrial strategy". It becomes clear, however, that the phrase means different things to different people.

In the following, we shall demonstrate what we mean by an industrial strategy and by using the pulp and paper industry, we shall illustrate its appropriate use.

Industry strategy, we believe, forms an integral part of a long-term plan of an industry. The essential parts of long-term planning are: the establishment of one or more goals; the establishment of one or more intermediate objectives; and the designing of one or more strategies -- that is, one or more techniques that are considered most effective for achieving the established goals and objectives.

An industrial strategy, then, pre-supposes that precise goals and objectives have been formulated. In other words, these parts become the blueprint of the developed plan of industry action.

One must appreciate that the very processes associated in creating such a plan is contrary to the spirit of the so-called free market system. In that system, it is assumed that the paramount goal of each firm (and coincidentally, of the industry) is to attain a maximum profit level and all the firm's strategies are singularly focussed on that end.

We in the Paperworkers Union believe that the profit goal, which is centered in the firm, is far too restrictive and its benefits too narrowly distributed. Further, we are of the view that the complete absence of any aggregate plan and direction given to the pulp, paper and allied industry group has caused it to drift from crisis to crisis and, therefore, to operate well below its long-term potential. Consequently, we submit that much greater private and public gains could be derived from this industry group if it operated under a comprehensive long-term plan, made up of broad goals and appropriate strategies.

In the following pages we shall illustrate our position by presenting a test model of a long-term plan for the pulp, paper and allied industry group. We shall submit three broad goals and then demonstrate in some detail how these are to be achieved -- that is, we shall examine strategies that will be required.

However, before we proceed with this model, we shall present in more detail what are regarded as company strategies; that is, given that the goal is profit maximization, what strategies does a firm pursue in order to attain that goal?

Recalling that a firm's priority goal is to maximize profits, corporate strategy refers basically to the relationship between the firm and its external environment; that is, with its effort to find ready markets for its products, at the best possible prices; its concern with finding secure supplies of raw materials; in its dealings with government regulations, and with minimizing their impact.

Whether or not a firm is successful depends on many factors: the internal resources of the firm, the quality of management, its ability to draw on technical, market and other research findings; management's ability to innovate (a scarce talent); its ability to take calculated risks, the general ability of the staff and the ability to sustain labour peace.

What actions a firm will take will depend primarily on the strength of the external forces and of the internal forces; action to innovate, to modernize, to cut costs. These forces may induce a firm to seek longer term goals - to obtain control over its product markets, prices, and over the raw materials markets. In fact, many of the more active firms seek to achieve the ultimate goal progression: to become multiproduct, multiplant, multiregional and multinational corporations.

The most striking characteristic of such an industrial system is that while all the firms of an industry pursue the same goal, the number of strategies pursued is numerous and most often quite distinct from one firm to another, some frequently being at cross-purposes with others. The results ensuing are that output, employment, etc., of the industry fall short of potential and even its product composition may become unbalanced, leading to instability.

Global Goals and Strategies -- A Simplified Model

It will be appreciated that the goals and strategies we have suggested to apply to the pulp, paper and allied industry group do not preclude others. Moreover, we do not dismiss the profit goal; we just give it a lower billing.

Suggested broad long-term goals covering the total industry group are:

- a) To maximize employment and the growth of income;
- b) To achieve the most profitable use of Canada's timber resource;
- c) To achieve growth of productivity; and to reduce the recurring

instability that plagues most parts of this group of industries.

Select strategies suggested for achieving the above goals are:

- a) by stabilizing the capacity of the pulp and newsprint industries;
- b) by maximizing output and employment in the other paper industries,

including converters;

- c) by stabilizing tariffs;
- d) by public and private investment;
- e) by consolidating markets and sales;
- f) by much greater emphasis on and co-ordination of research and

development.

It is evident that the major strategies we have presented are contained in proposals a) and b). With respect to a), stabilizing the pulp and newsprint capacity, this can be achieved by declaring a moratorium for a few years on any additional mill construction. Replacement of old mills would be allowed and modernization and optimization would be expected to accelerate. Both of these methods would augment tonnage capacity.

The second major strategy, b), not unrelated to a), suggests that the principal growth area ought to be the paper producing industries, including converters but excluding newsprint. The aim would be to double the aggregate capacity after a given number of years.

Reasons for Strategies a) and b)

The two suggested strategies not only are designed to contribute to achieving the indicated goals in our long term model plan, they are in themselves worthy of a detailed examination. In the following discussion, we want to demonstrate that these strategies make sense in principle, if not in all the details.

Canada is rich in natural resources. We also have a long, infamous history of selling off these resources at the primary or semi-processed stages. There is, no doubt, more than one reason why we have followed this path, but the most important one, we believe, has been our failure to plan, to decide on what we wanted from a major resource, in terms of employment and total income and then to develop the strategies necessary to achieve the established goals. In contrast, we have continued to rely principally on maximizing short term gains.

Our pulp, paper and paper products industries have drifted along a similar path. In consequence, the growth industries are pulp and newsprint. Because of this drift, we have managed to minimize the production of high-quality and/or high value-added products. These are the higher priced goods which generate higher employment and income by way of the multiplier effect.

While we have drifted along the primary products path, our competitors have managed to reverse that picture. On examination, we find that no country engaged in producing pulp and paper products is so limited to the pulp and newsprint production as Canada.

The following statistics reveal the deplorable situation. The term 'enriched' refers to high-priced goods -- that is, all paper products except newsprint. The percentages represent the volume of the 'enriched' to the total volume of pulp and paper products.

Enriched as Percentage of Total¹

<u>Country</u>	<u>Percentage</u>
Canada	13.7
U.S.A.	51.3
E.E.C.	74.4
Scandinavia	30.6
Japan	52.3
U.S.S.R.	42.1
"Others"	58.0

It does not seem to matter how we measure the product mixes in these countries, value or volume -- Canada emerges as the principal producer of pulps and newsprint. Even Scandinavia, which earlier emphasized pulp production, produces proportionately a great deal more of the high priced goods than Canada.

Our general trading relationship with the U.S. has been as the provider of raw materials and semi-processed goods. In the wood-based industries, we have supplied three-quarters of the U.S. need for newsprint, some pulps from branch plants and some market pulps, but relatively miniscule quantities of the high-priced products. That relationship has enabled the U.S. to concentrate on producing her own enriched products. As we observe in the table, the volume of these amounted to over half of the total production volume.

We also note from the table that the E.E.C. which produces roughly the same total volume as Canada (29 million tons to 32 million tons), three-quarters were high quality and/or high value added products. All the other producers, which turned out 42 million tons, produced relatively more high priced products.

¹Percentages calculated from information in Part II.

Canada needs to stand back and examine what alternative product mix we would like to have and what we are capable of achieving. Like our competitors, our pulp and paper products industries are influenced, among other factors, by world markets and advancing technologies -- forces that have not apparently prevented other producing countries from concentrating on the high value added production. We assume that Canada did not consciously select to become a primary producer. We got there, in fact, by conveniently neglecting to develop an industrial plan with attending goals and strategies. To reach and maintain this backwater of inaction, we were generously abetted by foreign interests.

The president of the National Research Council, W.G. Schneider, made the following observation about this point: "As a resource-rich country we took the easy road. As long as other countries needed our raw materials we could achieve a sufficient level of prosperity by inviting in foreign companies with the necessary technology to extract and process our minerals and forest resources and export them, not in the form of finished products, but as bulk primary material."¹

As we have observed, our competitors have endeavoured to achieve a more balanced industry structure than we have. In this, they have received public support in one form or another. Apart from a different form of protection, the support has encouraged specialization and large-scale operations in the production of high value added products. One notes a persistent trend toward industrial concentration by way of integration and mergers.

We make no moral judgement about giant corporations. On the one hand

¹The Citizen, Ottawa, November 28, 1979.

we are mindful, as suggested in the SRI study,¹ that such a giant is more likely to survive over the long haul and so protect employment. On the other hand, we realize that such a giant corporate body need not, and often does not, equate with good corporate citizenship, nor with the most forward-looking employer in its relations with its employees and their representatives.

The evidence we examined in Part II on concentration of large firms in the primary sector reveals that some of them are very large and growing larger; yet only a few play in the elite American and European league. We shall also note a dramatic contrast when we examine the firms producing high quality paper and other paper products.

The evidence available suggests that some countries place less restrictions on the size and growth of their enterprises. That would appear evident in the case of Europe. Even the U.S., which has frowned on monopoly practices, has spawned some of the world's largest multinationals.

In any event, and noting the success elsewhere, advantages might be derived by developing a number of world scale national trading firms in paper products. This might, however, require that the development be carefully monitored by the twin watch dogs, the Combines and Competition authorities.

Returning briefly to strategy a) of the model, we would suggest the following. With the profits in the primary sector running at such high levels and with the recently announced generous public support, we expect that the investment in upgrading and improving the machines and generally modernizing the pulp and newsprint industries will accelerate significantly.

¹Stanford Research Institute, 1977.

Our suggested moratorium on new construction of mills now makes good sense and the stay ought to remain in effect for a number of years, at least until strategy b), which we shall deal with next, has been adequately tackled.

While the pulp and newsprint firms specialize and some of their establishments are world scale, those producing quality paper, high value added products and converters are numerous, small, and generally very inefficient; some are just fly-by-night "in-and-outers". Most cater to local markets.

Few would deny that these groups require major overhaul. They are fragmented with firms and establishments lacking economy of scale. That is particularly noticeable of the converters.

For example, while the value of sales in the pulp and paper group as a whole averaged \$40 million per establishment in 1976, some of the converter groups indicated the following amounts: paper box and bag, \$4.6 million; corrugated, \$6.6 million; folding cartons, \$5.7 million; and the miscellaneous group, \$3.6 million. The majority of the 215 converters average, in fact, less than \$1 million a year per establishment.

It is difficult to estimate what the appropriate size must be to rank as a world scale producer. It is clear, however, that the vast majority of the paper products are produced and exported by large firms.

In any event, the signals from the trade picture indicate that if our paper producers (except newsprint) are allowed to drift along on the present course, without being re-shaped and re-directed by a comprehensive plan and appropriate strategies, they will not be able to cope with import competition from our neighbour and the paper exports, which amounted to 9% of total pulp and paper exports in 1977, are likely to decline. It is true, in the last two years with the exceptionally favourable exchange rate, these exports have held their own with respect to paper imports.

Nevertheless, we can't be satisfied with just holding our own in this area because our base is so anaemic in terms of our competitor. Our aim must be at least to double the output in the next ten years. It only increased by 28% between 1967-77. The higher rate would, of course, imply that our exports would have to more than double over the decade. That in turn implies that these paper producers and converters need to be dramatically reorganized and the equipment significantly upgraded. That will require a great deal of money. As we suggested earlier, the present situation, 1979-80, with profits running at an all-time high, and with the public authorities more willing to assist, affords an ideal opportunity for revitalizing these sectors.

An example of how such an overhaul may be achieved is offered by Scandinavia. During the past two decades, Sweden and Finland especially have pursued a comprehensive plan of restructuring their pulp and paper industries. Diverse techniques were used: modernization, deletion, integration, mergers, etc., and the building of world scale mills, thus achieving economy of scale. Comprehensive manpower programs were synchronized with the technical and organizational changes; these helped minimize the adverse employment and income effects produced by the changes.

We in the Canadian Paperworkers Union have previously made public our position with respect to financial assistance from federal and provincial governments to the pulp and paper industry. In resumé, it is as follows:

- We recognize that such assistance probably is necessary, although we underline that the needs of the industry in the 1980s result from their serious neglect to maintain and upgrade their physical plant in recent decades.

- It is presumed that the financial assistance will be used to bring stability to production and consequent long-term benefits to the industry's workforce.

- But this in itself is not sufficient. What is required is development of a formula to provide immediate and generous compensation to offset the impact of changes involved in the modernization process on workers and their families. Guarantees of implementation of such a formula should be a prerequisite to any public financial assistance to the industry.

- The workforce protection portion of the assistance should be directed, although not necessarily limited, to supplemented unemployment insurance benefits of workers laid off, maintenance of income for workers attending retraining courses or increasing pension benefits for workers who might take early retirement as a result of any reduction in manpower requirements.

- Further, another condition of such public assistance should be that governments obtain an equity position which should be a fair and realistic representation of their investment and the use of public funds by private enterprise should be scrupulously monitored.

- Finally, because of current high levels of industry profits, it must be mandatory that manufacturers themselves reinvest heavily in their Canadian operations, a responsibility they have seriously neglected in the past.

As part of the revitalization strategy, serious consideration ought to be given to the proposition that the public and private sectors co-operate in buying back the paper producers and converters held by foreigners. Up to 60% of the converters are in the hands of non-Canadians. Again, any public monies extended should show the governments' equity in the undertaking.

Another important strategy of the long-term goal of reclaiming these industries would be to ask the Competition Authority to declare a moratorium on the construction of any foreign branch plants.

Investment Strategy¹

In an actual long-term plan the various investment paths and composition would be included as investment guidelines. In the following, we shall merely examine changes in annual capacity of a select number of pulp and paper categories; over the long term, 20 years ending 1978, and what is expected to happen to capacity between 1978 and 1981. This will give us a rough indication of where the investment emphasis has been and where it is likely to be, in the absence of a long term plan and appropriate strategies. We shall then reiterate where we believe the investment emphasis should be placed.

Total wood pulp is expected to reach an annual capacity of nearly 24 million tons by 1981. The total increased at an annual rate of 3.3% in the 20-year period ending in 1978. It is expected to expand at an annual rate of 1.9% in the three-year period ending 1981. Dissolving and special pulps showed a negative rate (-.5%) in the 20-year period. The rate is expected to be 3.8% in the three-year period. Sulphite pulp showed a 0.5% rate increase in the former and the increase was concentrated in the first decade. The declining rate of the 70s is expected to accelerate. The long-term annual rate of sulphate was 7.8%; it is expected to grow by 2.6% annually in the three-year period.

¹Source: Canadian Pulp and Paper Capacity, 1978-81; August 1979.

The long-term expansion rate of newsprint is expected to continue until 1981 (roughly 2%); other papers are also expected to continue the long-term trend of some 4%. The expansion of paperboard is expected to fall below its long-term rate, 1.1% as against 3.6%. Similarly, the three-year rate of total paper and paperboard is also expected to be moderately lower than the long-term rate, 2.1% against 2.65%.

Most of the investment support for these rates is already in place or is declared. We note that many of the pulp and paper categories are expected to increase more rapidly than their slow growth rates of the 1970s. Nevertheless, the overall composition is not changing appreciably, which is to be expected in view of the large pulp component, over 60% of the total (44% in the U.S.). However, if the CPPA capacity figures of 1978 and 1981 are secure, there would appear to have been a marginal firming in the non-newsprint component of paper and paperboard during the past decade. We are encouraged to note the expected 6.9% growth rate of printing and writing paper. Unfortunately, that trend may be an aberration caused by our cheap dollar.

There is, therefore, and as one would expect, no discernible investment trend away from pulp and newsprint. In terms of goals we announced earlier, the whole structure remains inverted with a very broad base at the top of the lowest value added products and a small base at the bottom with the highest.

Our plan calls for a gradual reversal of this structure. The conditions for changing the investment direction are exceptionally good: the favourable exchange rate, very large cash flows plus the generous financial assistance from the public purse. Unfortunately, there is no guarantee that a plethora of cash will lead to investment decisions that will ultimately produce a more sensible industry structure. But the opportunity is there now for the federal and provincial authorities, as co-investors with industry, to develop jointly with industry a long-term plan with appropriate goals and strategies. We

feel that such a step will be a responsible one which most taxpayers would applaud.

While we support in principle governments extending financial assistance to industry, there is risk involved in this when the industry itself is flush. Some firms might well decide that investment in a paper mill in the southern U.S. would be more profitable, thus exporting large amounts of employment and income.

If the Canadian public is to share in investment, an increasing trend in most paper producing countries, we ought to insist as they do that all the investment be applied at home and in such a way as to benefit the industry and thus, all Canadians.

Tariff Protection

Barriers of some sort against foreign competitors are a hallmark of international trade. The initial rationale is to protect infant industries -- which usually grow into adulthood and old age without appreciably losing their protection. All countries producing pulp and paper products have employed the protection strategy. Some, employing tariff and non-tariff barriers, have generally achieved an industry structure that maximizes employment and income. Canada, being a strong believer in free trade, has continued to be a primary producer.

The recent marginal lowering of the overall protection umbrella, which does not remove the non-tariff barriers, is not going to change the international trading structure of pulp and paper products. Canada is still going to be the principal supplier of primary products.

In the following we shall demonstrate briefly and in general the various barriers and our own protection.

Canada supplies about one-third of the world's pulp markets. As might be expected, these products are allowed to move more or less freely into the U.S. and the E.E.C., although the latter still imposes a small penalty above a certain quota. South America and Africa, having infant pulp and paper industries, impose sizeable penalties.

Our newsprint is allowed entry to the U.S. duty-free; also into the E.E.C. below a certain quota, above which a penalty is imposed. Other countries have varying but effective barriers against newsprint.

As one might expect, all the countries that produce and consume paper products (apart from newsprint) and who have infant industries or follow a long-term strategy, have maintained effective barriers. They protect their industries either by excluding imports or holding them to a minimum.

The barriers against these products are still quite high in Europe. Moreover, a preferential trade agreement exists between Scandinavia and the E.E.C. These barriers, plus long transportation routes, effectively exclude our paper goods. Japan also maintains high barriers against these products. Moreover, such imports are only allowed when home supplies have been exhausted.

The protection offered to the paper industries in Canada and the U.S. is relatively low and roughly of the same magnitude. Neither use non-tariff barriers. The U.S. advantage in the markets for paper products (excluding newsprint) originates in the fact that most of their products are supplied by a small number of large, relatively efficient firms. In contrast, our products are supplied, as mentioned before, by a fractured group of small, relatively inefficient firms. Our main protection at the present time is the cheap dollar.

So, what should our strategy be to change the structure? It should be two-fold:

First, we should hold our export supplies of pulps and newsprint at roughly the present levels. This strategy would gradually force our competitors to shift more of their resources into producing those products. Assuming that the demand for the other paper products would continue to rise in those countries, we would be in a position to meet some of that demand.

The second and related strategy would be to shift more of the total public and private investment into the paper products industries, with the view of creating a few efficient firms. One might add that if the energy cost is going to increase at the rate and amounts which the politicians are hell-bent on achieving, it would appear to make good economic sense and good industry strategy for us to concentrate on the sectors of the industry that yield the highest return in terms of employment and income.

The Marketing and Sales Strategy

This strategy suggests that to centralize marketing and sales is likely to be a great deal more effective than the present decentralized approach. Such a move would therefore be in support of our overall goals.

In general, marketing and sales are activities designed to get a product to market, the selling of it and collecting the revenue.

Marketing and sales encompasses a great many detail functions such as: market research, product planning, setting and monitoring standards, pricing and credit arrangements, advertising, transportation, invoicing, bill collection, providing technical services and running sales outlets.

It has been estimated that the cost of marketing and sales (excluding transportation) amounts to something between 2% and 5% of the sales value of a product. With the industry grossing some \$6.5 billion in 1977, the cost

of marketing and sales might reach \$200 million. The amount is obviously sufficiently large to warrant finding a formula that would yield greater benefits.

The customary approach of industry is for each enterprise to develop and establish its own marketing and, where warranted, its own sales organization. However, even if we assume that each firm has found the most profitable formula, there is little doubt that when these functions are aggregated for the industry as a whole, they must surely be found to be highly wasteful and so very costly to the firms and to society which ultimately pays the cost.

The practical problems aside, although tradition would be a main obstacle, the advantages possible by placing the marketing and sales functions under one roof would appear great. They should be centralized to serve the whole industry, or at least a major portion of it. The model we have in mind is the organization developed in Finland, called Finpap (Finnish Paper Mills Association).

We appreciate the many practical difficulties of assembling and structuring such an organization in this expansive country; the regional differences, the product differences requiring distinct marketing and sales methods; overcoming the firms' inertia to make the decision. Yet the gains to be made by an organization more capable of opening up new markets and retaining old clients, and the reduction in costs from eliminating a multiplicity of services, would appear substantial. The logistics are not insurmountable.

There is no doubt that this strategy could be more easily achieved if the federal government provided some assistance in the early stages; possibly both finance and expertise. This would not be out of line with what it is attempting to achieve in the same general area now. The federal government

spends considerable sums on export promotions and export credits.

Our suggestion is not entirely novel. A modest form of co-operation already exists -- for example, the Canadian Pulp and Paper Research Institute and the Canadian Pulp and Paper Association. There is also some co-operation in sales -- the Canadian Overseas Paper Company that sells newsprint to Mexico and Australia, and the Export Sales Company that covers sales in the Far East on behalf of B.C. producers. Thus, the co-operative approach is not entirely foreign to the pulp and paper industries.

Unquestionably, a central organization, serving all or most of the needs of its members, appears to be a most attractive and logical strategy. Finland, in particular, has used this strategy most vigorously and, apparently, with considerable success. Finpap currently is said to be the world's largest export organization, responsible for some three-quarters of the total Finnish marketing and sales of paper products. Its aim is said to be to bring all marketing and sales of pulp and paper firms under one roof.

The Research and Development Strategy

With due allowance, research and development is to industry what rain and sunshine is to the soil. Given adequate funds and the proper priority mix, research and development is unquestionably the most potent force in the stimulation of productivity improvements and so in attaining and maintaining a competitive edge.

An employer who fails to recognize the importance of this strategy is likely to find his markets dwindle. Likewise, a country that does not support this strategy as effectively as its competitors will lose foreign markets and face shrinking home markets through foreign imports.

Usually, research and development is regarded as an essential cost item over the long haul. This is the case in most of the larger pulp and paper firms. However, since no long-term plan and strategies obtain, the strategy is often neglected under two conditions: during a number of profitable years and when there is a slump. The latter is understandable but regrettable for it is precisely then that research and development should be most active.

Much of the research and development work in the pulp and paper industry is pluralistic; that is, it emanates from widely dispersed sources. Most of the activities are carried out by the larger enterprises.¹ A great deal of work is carried out by the Canadian Pulp and Paper Research Institute and by the Canadian Pulp and Paper Association. Major innovations in equipment and equipment processes emerge from the equipment suppliers (mostly foreign), although the original ideas may have surfaced in one of the pulp and paper producing countries, including Canada. The Federal Engineering Institute of Canada is another innovator, endeavouring among other things to keep the harvesting technologies efficient. Many universities also supply the industry with their research findings.

While some useful inventions and innovations have emerged,² there is little doubt that apart from the insufficient input into the area, much duplication of effort and lack of co-ordination has reduced the results. Nevertheless, although the Canadian approach is less centralized than elsewhere, this is one activity area where effective co-ordination is likely to yield superior results to centralization. A maximum effort to co-ordinate the whole research and development program and to establish sound priorities would be an important aspect of the research and development strategy.

¹See Appendix 2, p. 168.

²See Appendix 3, p. 169.

The long-term record of investment in research and development in the pulp, paper and allied industries is, to say the least, abysmal. There is little doubt that the industries' long-term neglect of this factor account, in part, for the low productivity performance. Lack of a research and development investment strategy guaranteed that the aggregate group remained a primary producer; after all, the strategies of research and development are two-fold: to improve on the existing technologies and the systems operations; and to gradually enable the industry to shift its resources into producing higher value-added products.

The two columns below illustrate our points. The first column shows research and development as a percentage of sales in the pulp and paper industry. The second compares that factor in pulp and paper to total manufacturing.

<u>Year</u>	Total Intramural Research and Development Expenditures as Percentage of Sales (Pulp and Paper) ₁	Total Research and Development in Pulp and Paper as Percentage of Manufacturing Research and Development ₁
1967	1.12	7.71
1968	0.94	6.78
1969	0.81	5.76
1970	0.78	5.44
1971	0.68	4.33
1972	0.60	4.24
1973	0.51	3.92
1974	0.44	4.46
1975	0.54	4.48
1976	0.54	4.75

Various National Research Council presidents, while chastising the federal government for its continuing neglect of research and development,

¹Statistics Canada, Cat. 13-203.

have suggested that in relation to the emphasis given research and development in other countries, our expenditures ought to amount to about 1.5% to 3% of GNP. The 1974-79 government, realizing suddenly the importance of the factor, announced a target of 1.5% of GNP. Not to be outdone, the most recent government (May to December 1979) was shooting for 2.5%. In the meantime, according to the present National Research Council president, all research and development expenditures are running at 0.9%. We are distrustful of these targets, despite the much improved government incentive. We have a long history of purchasing and importing the results of research and development done outside the country. We are also mindful that a great deal of the research and development work is carried out by non-Canadians who own half of our industries.

In any event, if we assume that the percentage of research and development to sales equates roughly with the national percentage, then the percentages in column one demonstrate, as we said, the deplorable neglect of this factor in pulp and paper. The column also indicates a steady deterioration, hitting a low point in 1974.

In column two, we want to demonstrate two points: that the value of sales in pulp and paper as a percentage of value of sales in total manufacturing varies marginally between 8% and 9%. The percentages in the column show that research and development in pulp and paper falls well below the figure of 8% or 9%. The column also shows the deterioration until 1973, although not as deep as in column one, suggesting that research and development in total manufacturing did not decline as much.

As we indicated before, we are prepared to give qualified support in principle to the proposition that governments provide financial assistance to the pulp and paper industry -- this time to stimulate research and

development. However, to do so in the absence of a long-term plan for the industry, to do so in the absence of specific goals and appropriate strategies for research and development, is not productive and benefits can only be marginal. In the vacuum of lack of planning, research and development expenditures will, quite predictably, be directed to short-term gains.

It is now evident that public assistance to the industry for research and development is well entrenched. It is likely that a partnership between the private and public sectors will become permanent. Risto Ecklund gives substance to this prediction. Therefore it is incumbent on the State to ensure that acceptable long-term goals and accompanying strategies are established and aggressively pursued. Funnelling public money into the private sector without protective public policies is nothing short of requiring taxpayers to subsidize shareholders.

PART IV

MANPOWER AND INDUSTRIAL RELATIONS

Manpower

An estimated 133,000 workers (115,000 men and 18,000 women) were employed in the paper and allied industries in 1976. Of these, some 100,000 (90,000 men and 10,000 women) were classified as production workers. In like manner, there were an estimated 88,000 (82,500 men and 5,500 women) employed in the pulp and paper industry. Of these, 67,000 (66,000 men and 1,000 women) were production workers.

From the above information, we deduce that an estimated 32,500 men and 12,500 women were employed in the converting industries.

We also note from the aggregate statistics (see also Part II) that a wage earner in the pulp and paper industry grossed on average an estimated \$18,500 per annum in 1978 while the worker in the converting sector earned some \$12,700. Many factors account for this difference in earning power. The pulp and paper industry is a high-technology, large-scale and reasonably productive industry; wages tend to be commensurate with these factors.

The converters, on the other hand, may be characterized as being very small and generally very inefficient units, apart from a few larger ones where the technology is quite well advanced. Wages are also above average in the larger units. More women work in the converting sector and they tend to earn less than their male counterparts. Some 26% of total employment in the converters is female, compared with 6% in pulp and paper.

We also note from Statistics Canada (Average Weekly Earnings) that among the 20 or so industries where the capital component is relatively large

in relation to workforce, the pulp and paper industry ranks sixth and the paper and allied group ranks twelvth with respect to average weekly earnings.¹

In the following, we shall explore in general terms the estimated future growth patterns as they emerge in terms of our assumed objectives and long-term strategies. We shall then briefly note factors that tend to attract sufficient people to the industry and deal more fully with the factors that cause excessive turnover -- situations and factors that stimulate excessive mobility on the part of workers and which require special holding programs.

In the decade 1980-90, and having regard to the global market for pulp, paper and paper products, we shall assume that real per capita income will expand 30% or an average of 3% per year, also that the population of this market will increase by 10% or 1% per year. Thus, if we allow demand elasticity for paper products to be one, the annual consumption for paper products within this market should increase 40% or an average of 4% per year.

We shall assume further that Canada's participation in the overall consumption increase will amount to about 30% or 3% average per year. Our lower rate is caused by our model which assumes that the primary sector will not expand appreciably apart from an increase in productivity.

The effect on employment from the increase in consumption, and production, will depend largely on the amount of productivity increase during the period. If we assumed no productivity increase, a not very likely

¹For greater detail on earnings, see Appendix 4, p. 170. Pulp and paper ranks fourth when average hourly earnings are compared.

assumption, Canadian employment would increase some 30% or an average of 3% per annum. However, bearing in mind past productivity performance in the industry and, equally important, the recent stimulus to research and development and the likely technological and innovative improvements that are apt to flow from that, productivity ought to increase at least 20% or 2% per year. In view of that, employment is likely to expand only marginally during the decade -- along the following estimates:

	<u>Employment</u>		<u>Estimated % Increase in Decade</u>
	<u>1980</u>	<u>1990</u>	
Paper and Allied	133,000	146,000	10
Pulp and Paper	88,000	95,000	8
Converters	45,000	51,300	14

Thus, according to our assumption and calculations, the demand for manpower until 1990 appears far from vigorous, although much will depend on how these industries respond to the research and development carrot discussed in Part II.¹

In any case, that part of the industry operating in large towns and large urban centers (converters and others) should not face any serious manpower problems in the foreseeable future. There are, after all, one million idle persons (1979), most of them in urban centers. With the modest growth postulated, one assumes that it will take the better part of a decade to alter the current manpower surplus situation to a manpower shortage one, a highly optimistic assumption.

¹And, of course, to their profitability during the decade.

There is currently no evidence of any serious manpower problems in that part of the industry located in urban centers. The existing wage levels and the surplus of workers tend to reduce turnover and excessive mobility, although the normal drift from smaller, low-wage units to larger and more efficient ones does obtain. The relatively large contingent of women workers, many of them married, who are employed in the converting sector exerts a pull against turnover.

In case of the primary group, pulps and newsprint, the situation is quite different both in degree and kind. We have postulated no employment growth in this group. However, most of the pulp and newsprint mills are located in areas remote from urban labour markets. This, as we shall see, poses a number of special problems.

One of these problems originates in the fact that the primary group employs two basically different sets of production workers, the semi-skilled and the skilled who are in the front line of pulp and newsprint production; and the various maintenance crafts -- the electricians, machinists, millwrights, carpenters, etc. The first group tends to be unique to the industry, that is, their skills are not easily transferable to other industries. This, plus respectable wage levels negotiated by the union, will hold them in the industry. In contrast, the skills of the maintenance group are readily transferable to almost any other industry, and wages, although equally respectable, play a lesser role. Therefore, the amount of turnover is rather low in the first group, but high in the latter.

The second problem, related to the first one, is the effect on mobility caused by the factor of isolation and of course by the usually small remote labour markets. These markets do not bring forth the amount and kind

of manpower required by the pulp and newsprint mills, that is, apart from unskilled and possibly some of those destined for short-term training courses. By and large, the skills have to be imported and/or apprenticed.

We assumed in Part III that employment in the primary group would not expand. Nevertheless, and as one might expect, turnover and attrition by way of retirement and illness create a significant demand for workers, especially skilled workers. The experience in these remote areas suggests that the turnover of craft workers is particularly high and consequently constitutes a significant personnel problem to firms in these areas.

The high turnover is contributed to by the skill characteristics, but also by the workers' expectations and aspirations, both of which are rising. Scarcity of cultural varieties in the communities become a serious factor tending to weaken a firm's holding power, despite favourable wage levels and reasonable working conditions negotiated by the union.

It is readily understandable that unless a worker possesses a Canadian nordic spirit and outlook and a dash of the pioneering instinct, his aspiration will be to depart from the nordic climate as quickly as the opportunity presents itself.

Modern man has become a mass media man in that he clearly wants all the comforts and "goodies" to which he has become programmed; consequently, the remote wilderness comes to satisfy him less and less even when he is able to keep all lines open to the outside. A skilled worker in a place like Kapuskasing, Ontario, for example, will reason that what is available to him and his family is in no way commensurate with his income. He feels the place has short-changed him. The nightlife is scarce, culinary arts provided by modern trained chefs are missing and even the television may have limited range.

On a comparative basis he finds many other social amenities and opportunities lacking; and so he aspires for something better. In consequence, and especially if he is young, he'll do a short term of duty and move on, even should he have to accept slightly lower remuneration for the time being.

On the supply side, there will be some significant demographic shifts taking place during the 1980s; for example, a marked decline in the rate of growth of the 14-24 year olds. This may well exacerbate the shortage situation in the more remote labour markets. Moreover, the number with secondary education is expected to expand considerably during the next decade. If in addition labour markets generally tighten up as the mass of unemployed is drawn down, shortages of skilled labour could very well develop into a serious manpower problem for particular skills.

No magical or instant solution appears available that might resolve the turnover and expected growing "skilled" shortages, especially in northern areas. One long-term solution might be to shift mills that will ultimately have to be replaced to within commuting distances of urban centers. Bearing in mind that pulp and newsprint mills can now be constructed virtually pollution free, such shifts will no longer be politically or socially objectionable. Further, technologies may make it possible to construct chipping stations on the old timber reserves and then pipe the wood chips to the new mills.

Certainly, skillful manpower forecasting and comprehensive apprenticeship programs and other appropriate shorter term training programs are indispensable at any time. They will become even more so in the future. Moreover, training policies ought to be worked out by the whole industry residing in the remote communities and adjusted for local differences. These and other programs lend significant support to the principal holding programs, those negotiated by the unions.

Regarding the social aspects of the quality of working life, including health and safety, it has been the experience in industry that it is a profitable policy for a firm to demonstrate to its workers, by attitudes and actions, that it is as concerned with them as it is with the stockholders. Unfortunately, there is mounting evidence that in the matter of providing programs that would adequately protect the workers' health and safety, very few firms measure up. There has been considerable neglect in this area, partly owing to the lack of or insufficient understanding of the cause and effect and partly owing to industry's excessive emphasis on profits -- that a healthy firm is all that matters.

In any case, many corporations in consultation with the union need to review and strengthen their manpower and social policies because workers, as people, are becoming more independent and geographically mobile; these latter characteristics are on the rise. Thus, not only is the rate of growth of young people of trainable age declining, but they are expected to have more education than their parents. These factors, in addition to the leavening effect of rising affluence, will contribute significantly to the workers' show of independence and breadth of mobility.

In fact, rising affluence combined with high saturation advertising are producing a deterministic force that drives people to concentrate on comfort as a natural hedonistic goal. We see an abundance of this during the winter migration each year. Hundreds of Canadians used to follow the sun a generation ago; now hundreds of thousands follow it. By the year 2000, millions will do so each year. A similar but more general pull is being exerted on workers, especially in these remote areas.

There is clearly a growing reluctance on the part of people to work and reside in locations that offer less cultural and consumer variety and more discomfort than they aspire to find in terms of their income. Urban centers look more attractive; consequently, these remote areas demand, apart from suitable wages negotiated, that personnel and industrial relations policies be designed with a great deal more holding than those needed elsewhere.

Industrial Relations

Labour and mill management find themselves in a great many relationships during mill operation, the most comprehensive being the collective bargaining relationship. This is a formalized approach by which representatives of workers and of management bargain and arrive at an agreement which comprises the many terms by which many relationships are governed. The terms of the agreement affect most of the working relationships and include wages, hours and benefits as well as such matters as apprenticeship, scheduling and allocation of workers, etc.

The terms of the agreement are enforced by a special arrangement which provides for residual power -- a third person, the arbitrator.

In the process of arriving at these joint agreements, it is assumed that each party to an agreement is accountable to their parent body for the agreed-upon terms; also, that the terms arrived at are optimum to the workers and produce minimum cost to the firm. It is assumed, moreover, that the terms will produce satisfactory working relationships for a specific period between management and labour. This phase of the labour-management relations has been termed "interest democracy" because the process follows the adversary approach, each side seeking to satisfy his own self-interest.

From this it follows that because the process is adversary, an agreement may be arrived at with or without the ultimate lever of economic sanctions -- a lockout or strike. For a great many reasons, Canada's industrial peace record is not an enviable one, despite the near absence of politically induced stoppages, which are more prevalent in southern Europe.

While trade unions in Canada have found it more difficult than their counterparts in Europe to arrive at fair contract settlements without resorting to work stoppages, the pulp and paper unions show a reasonably good record in the post-war period. The accompanying Table 37 shows the aggregate man-days lost in work stoppages and, similarly, days lost in the paper and allied industries. It also shows the percentages of the latter to the former. Bearing in mind that the union membership in the paper and allied industries comprises roughly 3% to 4% of total Canadian membership, we can conclude from the information in Table 37 that, apart from the years 1957, 1973 and 1975, work stoppages have not been a major problem in the paper industries.

It is intriguing nevertheless to conjecture why North America always appears to rank near the top in the western world when work stoppages are compared. All countries use some form of the adversary system which means that the two groups in industry perform the role of opponents, each seeking their own particular goals or objectives. That is certainly true when we speak of wage determination; it is much less true in cases of all other union-management relationships where the ultimate objective in Europe would appear to be to run industry jointly.¹ As such, each regards the other with varying degrees of

¹At least until the most recent proposal, economic democracy, is realized. This newest idea advanced in Sweden (reported by the Manchester Guardian Weekly, September 3, 1978) consists of two parts: a) by taxing wages to establish regional development funds for investing, primarily in export industries; b) a mandatory one-fifth of profits in companies of 500 or more employees, and listed on the stock exchange, would each year be converted into new stock to be held jointly by unions. These two provisions would enable unions to participate and vote in stockholders' meetings. (The latter idea, stock-sharing, is actually a brainchild of the Danish LO from the late 1960s)

TABLE 37

Work Stoppages, Total All Industry and Paper and Allied
(1946-75)

	<u>Total All Industry</u> <u>(000's man/days)</u>	<u>Paper and Allied</u> <u>(000's man/days)</u>	<u>% of</u> <u>Total</u>
1946	4516	1	-
1947	2397	22	0.9
1948	886	-	-
1949	1064	2	-
1950	1389	4	0.3
1951	902	21	2.3
1952	2880	1	-
1953	1324	34	2.6
1954	1475	3	0.2
1955	1875	35	1.9
1956	1246	10	0.8
1957	1635	189	11.6
1958	2872	142	4.9
1959	2887	-	-
1960	739	12	1.6
1961	1335	-	-
1962	1468	8	.5
1963	917	25	2.7
1964	1581	29	1.8
1965	2324	49	2.1
1966	5071	56	1.1
1967	3975	80	2.0
1968	5083	335	6.6
1969	8057	234	2.9
1970	6540	361	5.5
1971	2867	94	3.3
1972	7754	27	0.4
1973	5776	732	12.7
1974	9255	236	2.7
1975	10859	2885	26.6

(Canadian Department of Labour)

mistrust or distrust. When mistrust is maximized, the adversary system becomes a pure power system in which strikes and lockouts become the rule for resolving issues rather than exceptions.

Bearing in mind the frequency and duration of work stoppages in this country, especially in the last decade, the question follows why in so many countries such as Scandinavia, West Germany and Holland, contract settlements have been reached with a minimum of industrial conflict.

Many factors contribute to strained relations in Canadian firms and to occasional bitter resolutions to disputes. We would submit that one of the most pervasive factors in the situation is that while in the European countries unions have been completely accepted as a valid and indispensable part of the democratic fabric, Canadian unions have not. In consequence, an uneasy truce prevails in our industries which, in turn, has encouraged many tycoon-minded corporate management to flirt with the idea of disposing of their unions. Constructive relationships cannot be expected in such an atmosphere.

Another difference lies in their broad based approach to collective bargaining. They have also experimented a great deal more than we have with various worker-management, union-management approaches for resolving issues. These experiments, and given the complete acceptance of each other, have helped mature attitudes toward bringing about resolution of emerging problems.

Another basic difference between us and Europe is that they tend to maximize much less the traditional difference between managing and working and so between management and the worker.

Apart from the administration of the contractual arrangements governing the employer-employee relations, a task that can by neglect sour working relations and so add unnecessarily to the natural tension always present, there

are other areas of relations within the workplace. Many of these would be difficult and some impossible to include within a collective agreement. It may be that the Europeans have paid more attention to these "other relations" than we have and that the recognition and fostering of these have contributed to more constructive attitudes and less conflict.

Four strategies have been employed to achieve better relations in industry.

The first of these is the highly important management function of conveying information: a consistent system of keeping the firm's workforce fully informed about matters of interest to it concerning the firm's operations. In Europe, this function is regarded as essential to constructive relations and constructive bargaining. The function is said to be fulfilled when the information available to management is also available to the workers. While this is a unilateral function, it is highly important for we must assume that the conveyance of factual information is superior to rumours. The practice is not unknown in Canada, but less widely used.

The second scenario has to do with communication and co-operation. As we know, numerous points of irritation and misunderstanding can arise and fester within the work place. These need not and ought not clog up the formal grievance machinery. Actual or potential annoyances need to be removed, because they may cause unnecessary tension and so worsen relations.

In Europe, that function forms part of the Work Council's responsibilities. The Work Council is a legal instrument with wide powers, its principal function being to resolve or prevent emerging industrial problems within its jurisdiction.

Canada has attempted to cope with similar problems by creating the Labour-Management Co-operation Committee. The committee is a voluntary

instrument, encouraged and assisted by the federal Department of Labour. Its effectiveness has proven very spotty; its mortality rate rather high.

According to the records,¹ there were 148 such committees covering some 50,000 workers in the paper and allied industries in 1975. How many of these are alive and functioning has not been ascertained.

The previous two scenarios, and collective bargaining as well, do not appreciably alter the traditional division between management and workers. Collective bargaining establishes the terms and these are altered from time to time. The other two are simply tangential to the traditional arrangement although they can assist in making the employee-employer relations less tense.

The third scenario, which social scientists refer to as "quality of work life" or "work-linked democracy" is a reference to the semi-autonomous work groups. These were a response to the effects of advanced technology on the worker. Modern technology, in its inexorable march towards automation, strips the worker of certain needs and aspirations by ignoring them. That is, advanced technology and the accompanying minute sub-division of job duties render work increasingly more sterile because the job doesn't require much of the worker's innate skills or ability to make judgement.

The concept of the semi-autonomous work group was spawned at the Tavistock Institute and given early experimental application by Thorsrud in Norway. From there the idea spread to a number of countries, including Canada.

The shift from the single worker per job approach to group responsibility for one phase of work meant restructuring jobs so as to allow for the collective

¹For further details, see Appendix 5, p.171.

approach (usually six to eight persons). Enrichment of work is assumed to follow because in the new work environment the jobs can be rotated and, most important, the group assumes control over the work flow, product quality, seeing machinery is in working order, etc. In other words, both the work and managerial functions at the shop floor level are assumed by the work group.

Restoring meaning to work by stripping away the monotony and drudgery and creating work that draws more on the worker's total abilities, are worthwhile objectives. However, the transformation calls for a redesigning of technologies and the retraining of workers to operate in groups. Both of these necessary conversions require effort and careful planning.

While the number of such groups is now very large, they only account for a small portion of total industrial work. And, as one might expect, their penetration has been much greater in Europe than in North America. How much contribution they have made to improving the adversary system is impossible to assess. They have improved work motivation.

The final scenario we shall examine is referred to as "representative democracy", so called because of its striking analogy to political democracy. It is, however, notable that representative democracy falls almost exclusively within the European ambience. The approach calls for elected worker representatives to sit on supervisory boards of corporations. Workers may have a minority, or equal, representation with the chairman selected from the outside.

The prime reason for the emergence of the joint worker-investor representative board stemmed from the workers' persistent questioning of the traditional view that only the investors were interested and concerned with the decisions made by the board.

The workers argued that company boards frequently made decisions such as where, when and how much to invest, closing down operations, moving to a new site, introducing new products, etc., which could seriously and vitally affect their lives and livelihood.

The objective therefore became to ultimately attain a position that permitted workers joint (co-determine) decisions with representatives of the investors.

We have made no approbation or critical statements about any of these techniques. Some of them are European in origin and use, although that does not necessarily disqualify them. After all, they have been introduced with a view to prolonging the capitalist system -- not for the benefit of any one party in industry.

Two aspects of the industrial situation ought to be kept in mind, however: factors such as affluence, advanced technology, higher education, etc., have significantly altered the attitude and behaviour of the workers during the past two decades. On the other hand, we as trade union representatives, and management representatives as well, have not fully recognized the new dynamics in the industrial relations situation and by inertia have remained with the status quo. There is little doubt that these two co-ordinates, workers' changing needs and aspirations in a materially changing world, and our failure to respond appropriately, may well have exacerbated labour-management relations.

These, then, are practical areas where the solution to excessive work stoppages is likely to be found. They are: the collective bargaining area, that part of labour-management function lying outside management's confines, and that part of labour-management joint activity crossing management's border.

We note in the Report by the Pulp and Paper Industry on Labour-Management Relations in Canada¹ that the industry acknowledges the seriousness and magnitude of the relationship problems. However, we do not deem the recommendations proposed as solutions particularly helpful for the near future. We agree that industry, unions and governments must work toward a more broadly based form of collective bargaining; some consensus must be sought, annually, that will indicate and delineate Canada's major problems as well as those of the paper industry; also, a consensus that will indicate a fair distribution of the economic increment created by industry and through trade. That consensus, we are afraid, lies well in the future.

We are also disappointed in the negative attitude found in the report's recommendations, those touching on management territory. The Canadian Paperworkers Union does not hold any dogmatic views as to how best to resolve labour-management problems. We believe, however, that both we and the industry should agree on a technique by which we can explore and examine together any means that promises to produce less strain in the various work relationships. To achieve the best results, we must both come to the problem with as few pre-conditions and as few traditional biases as possible.

In the case of the collective bargaining function, we, the representatives of the Canadian Paperworkers Union, are prepared to enter into discussion with representatives of management of the industry with a view to finding a more effective and rational way of reaching satisfactory collective agreements. One aspect to examine would be that of the wider-based approach to bargaining.

¹Views of the Pulp and Paper Industry Concerning Labour-Management Relations in Canada, CPPA, May 1977.

It may be, for example, that an industry-wide approach is now called for. In that case, we must explore what factors may militate against us reaching economic consensus at the global level and what factors would facilitate such an approach. Other wider-based units might be examined such as the region and combination of regions.

Should the industry-wide unit prove agreeable to both as an experimental unit, consideration would have to be given to such matters as the joint use of statistical and other information. Such joint use of information has proven by experience elsewhere to be indispensable to the process of reaching economic consensus at the central level of bargaining.

The second phase of the relationship area that would derive benefit by joint examination and scrutiny is the traditional labour-management function. Most Canadian industry and trade unions recognize the value of the labour-management approach as it operates in two important areas; one of these has to do with the company's social programming, a function that helps immeasurably in making the plant or mill a better place in which to work. In this area, the joint participation of workers and management can pay dividends.

The second of these two areas is work-related. Experience has shown that in the absence of the joint co-operative machinery, a great many problems can arise and can accumulate over time and so ultimately place an onerous burden on the negotiating machinery. It has also been found that most of the problems thus arising can be readily resolved at their inception. In fact, a joint approach is indispensable for clearing the deck and keeping it clear of such problems, thus preventing the build-up of tension and an over-loading of the negotiating machinery.

We are of the view that the status quo workplace is no longer suitable to the modern industrial setting. Changes need to come about, and we believe that the employer and trade union are best suited to bring about a new accommodation.

In principle, we agree with the summary views of the workplace offered by an American research professor of psychology: "The workplace in America is among the most conservative of our institutions. It has been highly resistant to change, particularly to the successive waves of individualism that have swept over so many other areas of American life. To be sure, at the stratospheric levels of giant corporations, trade unions, government bureaucracies, hospitals, and other institutions, individualism flowers for top-level executives. In these great baronies of our society, the self-fulfillment needs of those at the top are given full play; but all other employees are expected to conform to rigid rules of group behaviour. On ceremonial occasions, obeisance is paid to them: 'Our people are our greatest resource and we must pay attention to their needs', their leaders say. But in everyday life, attention is paid to everything but people -- capital requirements, technology, material resources, managerial skills, political pressures, cost controls and markets."¹

In conclusion, we want to make it clear that while the CPU representatives show interest in exploring with employers any reasonable techniques and strategies that would assist in improving industrial relations in the pulp and paper industry, collective bargaining must of necessity remain the principal relationship. We are cognizant of the fact that many problems and issues are amenable

¹Psychology Today, May 1978.

to joint resolutions without resorting on every occasion to a matching of strengths. We are not at all satisfied, however, that management in this industry has unequivocally demonstrated by their attitudes toward their workers and worker representatives that they comprehend what is required of them in this area; nor that they really are interested in improving the various relationships. As the above quote suggests, employers tend to be interested primarily in and preoccupied with the non-human factors, except on ceremonial occasions.

PART V

THE PULP, PAPER AND PAPERBOARD INDUSTRIES - LONG-TERM PROGNoses AND DEVELOPMENTS¹

As in the case of most industries, firms in the pulp, paper and paperboard industries seek to acquire as much information as possible about the factors that are likely to influence the demand for their products in the short and long term. The more comprehensive and accurate a firm's prognosis is, the more sensible and profitable its investment and production decisions are likely to be and the more secure is employment and income.

As we observed in Part II, there is a remarkably close correlation between changes in demand for paper products and changes in the per capita income in constant dollars (or other currencies); that is, in terms of real growth of GNP and population growth. In fact, experience indicates that there exists a fair correlation between per capita real income and the aggregate demand for paper products at the global and sub-global levels.

¹The content of Part V is based heavily on five reports which, when taken together, cover the short, medium and long term developments of these industries, globally and for certain regions:

a) Prospects for the Pulp and Paper Industry Worldwide; Risto Ecklund, January 1977.

b) The Canadian Forest Products Industry, Industry Trade and Commerce, November 1975. (preliminary)

c) An assessment of pulp and paper demand and supply, 1975-79. Food and Agricultural Organization of the United Nations, November 1975.

d) Investment Outlook and Related Federal Policies for the Paper Industries, 1976-1985. Stanford Research Institute, California, January 1977 (prepared for U.S. Department of Commerce).

e) Report to the Steering Committee of the International Federation of Chemical, Energy and General Workers' Unions (ICEF), February 1978.

It is therefore clear from that equation that if someone is capable of producing a reliable trend line of economic growth for each geographic area, the aggregate demand for the paper and paperboard products, or for all products combined, will be known with some certainty.

While the global demand profile is helpful for understanding broad trade and price developments, a firm needs, of course, more specific and detailed information at the sub-aggregate level in order to formulate its decisions. As we know, pulp, paper and paperboard cover a number of industries and a wide variety of products -- using different technologies and equipment, having different market characteristics and values, substantially different structure, integration, profitability, etc. A firm, then, is likely to need information, not only about global economic growth at home and abroad (to cover export and import competition), but the demand-supply situation and development for its particular product or products; or if it is a pulp firm, the demand developments of the paper and paperboard products in the relevant markets. It also requires information about non-market factors, such as possible changes in tariffs, as well as market analyses of its various inputs. All this information becomes input grist for the firm's decision-making process that may lead to changes in capacity, the production volume and employment.

Fortunately, thanks to the arrival of the computer, instant forecasts have become possible and available. Unfortunately, its reliability still depends on people -- on their ability to make intuitive assumptions about certain key variables.

Widespread uncertainty and the persistent slow economic growth, especially in the developed world, have obliged the forecasters of recent past to continually revise downward their estimates of economic growth and the

global demand for paper and paperboard products. In fact, both the determinants of demand for these products, economic growth and population growth, have decelerated in recent years. Risto Ecklund now suggests that over the long haul, until 1990, population in the developed world will increase by only 1% per year, 2% to 2.5% per year in the developing world.

Ecklund's report also suggests that economic growth, as measured by GNP, is expected to increase by 4.5% per year in real terms over the period to 1990 for the world as a whole. Real growth is expected to be somewhat faster in the developing world. Real growth in North America and Europe may range from 3% to 4% per year.

Another recent study (quoted in Mr. Ecklund's report) predicts that the rate of world economic growth for paper products that ran at 5.6% per year in the 1960s will slow down to only 4.6% per year in the 1970s and then fall further to 4.1% per year in the 1980s (both figures are likely to be too optimistic).

In the prognosis supplied by the Stanford Research Institute, the prediction for the U.S. is for a real economic growth of 4.3% per year in the 1976-80 period and 3.6% per year during the 1980-85 period.

Similarly, Industry, Trade and Commerce of Canada estimates an annual real GNP growth of only 2.2% per year in the period 1980-90; they also predicted the average annual economic growth in the U.S. for the same period as 2.5%.¹

These forecasters would be the first to acknowledge that even apart from catastrophies, economic growth and therefore paper demand can alter course quite suddenly. Moreover, while the demand for paper products does

¹See report, the Forest Products Industry.

correlate well with economic growth under "normal" conditions, the supply of a paper product is determined by a number of variables such as capacity growth, which in turn depends on profitability and the availability of capital, as well as the availability of raw materials.

Broadly speaking, the consensus appears to be rather firm that the global demand for paper and paperboard products is likely to remain sluggish for some years. If that transpires, the demand for various pulps will also be sluggish. Such a development has, of course, implications for Canada which supplies about one-third of the world's pulp export markets. We shall return to this matter at a later stage in the report.

There is also agreement that the global structures of demand and of supply, as well as the composition of products, will alter markedly over the long haul. That suggestion is credible, being the natural consequence of differential regional growth, different competitive strengths by industry and region and the vastly different endowment of wood fibre and the availability of capital. The following statistics will suggest why there is likely to be significant regional shifts in the demand-supply picture of the future.

It has been estimated¹ that North America and Europe, which together possess 21% of the world's forest area and 25% of the population, produces 77% of the world's forest products. On the other hand, Latin America and Asia, which together have 50% of the world's forest area and 70% of the population, produces only 10% of the forest products. Further, Africa which possess 15% of the forest area and 10% of the world's population, produces at present only 1% of the forest products.

¹See report to ICEF.

As a group, Europe and North America, which have historically supplied the rest of the world with pulp, paper and paperboard products, are expected to continue that service for many more years, although the dominance held by these two regions is expected to decline gradually with time. In fact, the prognosis is that North America which accounted for some 40% of the paper market in 1976 will account for only some 33% by 1990, despite its own large continued expansion.

While North America and Europe continue to be net exporters of most paper and paperboard products, it follows that the rest of the world will continue to be net importers of these products. Even the U.S.S.R. and eastern Europe are expected to be net importers of over one million tons (1.3) of paper and paperboard products in 1980.

It is interesting to note that the U.S.S.R. which accounts for some 25% of the total forest area of the world, mostly in high quality conifers, has certainly the potential to become a major competitor in the world pulp, paper and paperboard markets. Fortunately for the competitors, the U.S.S.R. is under some constraints. It has to meet a massively large domestic need of lumber and many of its major forests are relatively inaccessible. Nevertheless, it is not likely to remain net importer of paper for very long. In the meantime, it is supplying Sweden and Finland with much-needed roundwood.

Indications are that the developing world will continue to be net importers for many years, especially for industrial paper products but also for cultural papers (newsprint, writing and printing papers). However, it is also predicted that domestic capacities may expand faster than consumption and thus gradually reduce the present gap between requirements and domestic

capacities. This shift will also mean a gradual reduction of the net export volume supplied by North America and Europe. Moreover, pulp production is expected with time to move into a net export position for the developing region as a whole, thanks largely to rapid pulp developments in Brazil and North Central Africa.

The regional picture varies, of course, considerably and is expected to change significantly over time. We shall examine briefly some of these developments.

After many years of effort to exploit the virgin tropical forest of west and central Africa, the final contract for the first plant using such wood was signed in 1976 -- to have been completed in 1979. The mill will be operated by Cellucan S.A. and is owned by the Cameroon government and the Cameroon Investment Corporation. It will produce 122,000 metric tons per year of bleached market pulp - destined for export to Europe.

While the construction costs of this mill, as for others under construction in the developing world, are very high, it will enjoy advantages of inexpensive wood fibre, low taxes and low wages. Thus, despite the high carrying cost, the product is likely to be competitive in Europe, both with Canadian and European pulp prices.

Other mills are slated to come on stream in Africa in the 1980s.

The most active pulp program in the southern hemisphere is found in Brazil. Its installed capacity of pulp exceeded two million tons in 1977, about three times its 1970 capacity. Two-thirds of this capacity is short fibre pulp.

Pulp consumption in Brazil is also expanding rapidly, about 7% per year; it is not likely, however, to exceed 1.7 million tons by 1980. On the other hand, according to a survey by the Brazilian Paper Industry Association,

pulp capacity is expected to expand another 1.5 million tons by 1980 or a total pulp capacity of 3.5 million tons. That means that at least 1.5 million tons must be disposed of by export -- principally to European markets. Disposing of that volume of short fibre pulp may pose quite a problem, however, at least for some time. European producers are accustomed to and prefer long fibre pulp, which no doubt produces stronger products. Extra strength would appear particularly important in newsprint where greater strength enables printing presses to run faster.

Of course, the determining factor will be price. Construction cost of the pulp mills is said to be very high, but cheap wood and cheap labour is likely to make the product competitive with the higher cost of Canadian and Scandinavian long fibre pulp.

It is apparent that an oversupply of short fibre pulp is developing and as a result, if the price falls sufficiently below the long fibre pulp, some papermakers will make the appropriate shift.

At any rate, the vast amount of eucalyptus trees which can reproduce themselves in seven years, compared with 60-70 years for the Canadian and Scandinavian pine, give Brazil the potential for becoming an important pulp and paper producer after 1980. Most of the surplus, however, is likely to be in the form of short fibre pulp for a great many years.

Another notable development in evidence in several Latin American countries such as Mexico, Peru, Argentina, and Cuba -- all major sugar producers -- is the gradual perfecting of technology which allows pulp and paper to be manufactured from bagasse (residue from sugar cane after liquid is squeezed out).

"Mexico has been a world leader in bagasse pulp and paper production and the first industrial scale mill for newsprint was scheduled to start there in early 1978. Papel Periodico, in Veracruz, will be a 100,000 ton a year newsprint mill using bagasse, with the prospect of doubling capacity in a few years when exports will start to flow." (From ICEF report)

Peru, which has done a great deal of pioneering work in bagasse papermaking, had its first major mill, 110,000 tons per year, in operating in 1978, using the Cusi process from Mexico. Similarly, Argentina is expected to have a 100,000 ton per year mill ready for 1980.

The main problem encountered by using bagasse as the basic input for newsprint was that the length, diameter and wall thickness (morphology) of the fibre produced lower opacity than was desirable. That has been overcome by using a considerable amount of fillers (6% instead of the usual 2%). The newsprint produced from bagasse is said to be strong and the addition of softwood mechanical pulp improves its opacity.

Most of these countries have had to import their newsprint from Europe and North America, an item that has loomed large in their import package and balance of payments. It was therefore understandable that these countries would go to some length, and to a great deal of expense, to find a technology that would enable them to utilize their abundant supply of bagasse in order to secure their domestic supply of newsprint.

There is no evidence that the supply of bagasse is sufficient to make these countries self-sufficient in and exporters of newsprint. However, the domestic production volume of newsprint after 1980 is likely to cut into the export volume that normally has come from Europe and North America for use in these countries.

Apart from these Latin American countries, Colombia and Bolivia are reported to be well endowed with timber, but the forests are mainly in the mountainous regions far removed from population centres. There is no infrastructure in place which would make exploitation of the resource economically possible.

The data in the following tables, selected from the FAO annual projections for 1980, provide among other things a useful capacity profile of the major pulp, paper and paperboard products of the world, major regions and sub-regions. We have supplied the distributional profiles for 1980 and for 1970 for most of the regions and sub-regions.

As in many other endeavours, the developed market economies dominate the capacity volume in all product categories, although it will be observed that their overwhelming dominance is slipping quite perceptibly. We must assume here, of course, that the FAO projections for 1980 are consistent and will be reasonably near the mark by that date.

With that assumption in mind, we note that the share of the world pulp capacity, held by the developed economies, is expected to shrink from 87.6% in 1970 to 81.9% in 1980; in contrast, the share controlled by the developing countries will increase from 2.5% to 6.6% during the decade.

This shrinking trend is remarkably similar for all product categories in the developed world; and all product capacities are expanding at a fairly rapid pace in the developing countries.

That process is quite understandable; the expansion in the developed economies is slowing down largely because these industries are operating at near optimum in terms of resource availability. In contrast, the industries in the developing world are still somewhat rudimentary.

TABLE 38

PERCENTAGE DISTRIBUTION OF PAPER PROUDCT CAPACITY BY
COUNTRY AND MAJOR REGIONS, NEWSPRINT AND OTHER PAPERS, 1970 & 1980

<u>Regions</u>	<u>Newsprint</u>		<u>Other Papers</u>	
	<u>1970</u>	<u>1980</u>	<u>1970</u>	<u>1980</u>
Dev'lt Mrkt Economies	87.5	83.5	83.2	80.2
North America	50.6	45.7	39.0	33.4
Japan	8.3	11.2	8.1	8.9
West Europe	26.3	23.9	35.2	36.5
Oceana	1.7	1.8	-	-
Dev'ing Mrkt Economies	2.6	5.8	5.8	8.6
Africa	-	-	-	-
Latin America	1.4	3.1	3.2	4.1
Asia	1.2	2.5	2.3	3.9
Central Pl'ing Economies	9.9	10.9	10.9	11.2
Asia	2.9	3.3	3.2	5.4
East Europe	1.7	1.5	3.4	2.5
USSR	5.3	5.9	4.2	3.3

TABLE 39

PERCENTAGE DISTRIBUTION OF PULP CAPACITY, BY COUNTRY AND
 MAJOR REGIONS, TOTAL, AND CHEMICAL PULPS, 1970 and 1980

<u>Regions</u>	<u>Total</u>		<u>Chemical Pulps</u>	
	<u>1970</u>	<u>1980</u>	<u>1970</u>	<u>1980</u>
Dev't market Economies	87.6	81.9	87.9	80.7
North America	53.3	47.4	56.9	50.2
Japan	8.5	9.0	7.7	8.4
West Europe	24.2	23.4	22.2	20.8
Oceania	1.0	1.5	0.7	1.0
Dev'ing mrkt Economies	2.5	6.6	2.4	7.8
Africa	-	0.4	-	0.5
Latin America	1.9	5.1	1.9	6.4
Asia	-	1.1	-	1.0
Central Pl Economies	9.9	11.5	9.7	11.5
Asia	1.4	1.8	1.1	1.7
East Europe	2.5	2.7	2.4	2.6
USSR	6.1	7.0	6.1	7.3

FAO/72

Nevertheless, the developed world is expected to control four-fifths of the world's capacity in most product categories by 1980. On the other hand, a significant differential growth rate between the two regions is likely to continue for a great many years, with the developed world sharing increasingly less of the growing world capacity total.

Of greater concern to us, as revealed by Tables 38 and 39, is the slow growth and the shrinkage of the world capacity held by North America. In contrast, as the same data show, western Europe (where Scandinavia holds a dominant position) is expected to hold its own, apart from newsprint, during the decade.

Many complex cost factors no doubt contribute to the differential competitive levels reached by each. We believe that a very important contributing factor is that North American capacity has undergone more modest structural changes and revitalization. Further, we conclude that a significant portion of the North American industry is old and tired. The rate and extent of structural changes in capacity of pulp, paper and paperboard in western Europe (especially in Scandinavia) has been, apparently, greater and so has produced a competitive advantage in most of these product categories - except kraft liner where the southern U.S. is said to have structural and other advantages.

Another contributing factor to the competitive advantage gained by western Europe may be found in their higher levels of research and development expenditures applied in the industries during the past 10 to 15 years. One might also add that public participation, especially in heavy costs of pollution abatements, have been considerably higher in western Europe than in North America.

We note from the expected annual average increase, 1975-80, that the developing world is emphasizing expansion of chemical pulp and newsprint. That supports what we observed earlier regarding pulp developments in north central Africa and newsprint and pulp developments in Latin America.

We note also from these statistics that capacity in the centrally planned economies is expanding faster than world capacity, showing a marginally higher share of world capacity in 1980 than in 1970. However, as we pointed out earlier, these economies will continue to be net importers of paper products in the early 1980s.

In summary, then, the developed world and especially North America is losing ground in the world expansion of pulp, paper and paperboard products. The shrinking share of total expansion is likely to continue as the rate of capacity expansion in the rest of the world outpaces those in North America and the rest of the developed world. Insofar as Canada has developed product capacities matching those of the developing world, pulps and newsprint, we are likely to encounter some severe market problems, especially in the case of market pulps,¹ a situation likely to be exacerbated by our relatively high cost structure. Of course, the big, highly integrated firms, which are generally self-sufficient in pulp, will be better shielded than others from any on-going price wars.

Another determining factor in how keen that competition may turn out to be is the evolving relationship between the rate of expansion of consumption and production in the developing market economies. They are expected to be net exporters of pulp in the near term while being at the same time heavy net importers of various paper products.

¹Canada supplies one-third of the world's export trade of market pulps.

Two crucially important factors, capital and wood fibre, are likely to have far-reaching and differential effects on capacity expansion in the near term but especially in the longer term with respect to wood fibre.

All the reports referred to herein seem to agree that the shortage of capital is the most crucial short-term problem. As mentioned in Part II, the costs of constructing a modern mill have escalated between two and three times over a relatively few years. Consequently, despite the hefty advance of product prices during the period, which have yielded some very unusually large cash flows, these price advances apparently fallen short of generating the kind of cash flows commensurate with the high costs of building modern paper mills.¹

One report (ICEF) suggests that "the rate of return needed to service borrowing requirements and to show satisfactory performance to the stock market have stretched from 20% to 35%". Be that as it may, any rate above 20% would produce excess profits. In any case, the cash flows, especially in 1978 and 1979, are apparently more than sufficient for revitalizing and raising the industry's productivity.

New capacity, then, is likely to come primarily, as the U.S. report (SRI) suggests, from the very large integrated corporations. The implication in this is that the smaller independent and low integrated firms are likely to be squeezed out over time, thus leaving the big integrated firms to grow. The ICEF report provides an illustration of the power and profitability of the very large firms: "In 1976, the top 20 companies on a world reckoning - 16 of them in North America - accounted for 54.5% of the total sales of the top 100 group, and for a massive 71.3% of the net earnings."

¹Canada could prove an exception if the favourable exchange rate continues. It is helping to generate some extraordinary large profits. But, as we recommended earlier, the extra cash might be better used in increasing the industry's efficiency and productivity, including improved health and working conditions.

At any rate, the question of availability of capital is expected to continue to be a governing factor in the rate of capacity expansion (i.e. new mills) for some time. Moreover, according to the reports, high construction costs seem to be harassing both the developed and developing world. The central planning economies are visibly less concerned with such matters, although the shortage of capital and allocation of capital are problems characteristic of any system.

The resolution of the above situation is to be found in augmented public participation. The ICEF report refers to certain specifics:

"Government monies loaned at special low rates, as in France, or tax-free grants, as in U.K. ... helping to shore up investment position."

Risto Ecklund sees it as a general trend: "In most parts of the world, the future development of new mills is to a large extent dependent on the availability of State support." He doesn't say, but we must assume that a great deal of the state help is in the form of shared equity rather than outright subsidy.

A sidelight to the financing problem is reported by Mr. Ecklund: "There are indications that debt is becoming preferable to equity as a means to raise capital."

The second important factor that is already influencing productive capacity, geographically, as well as trade in wood fibre, is the shrinking timber resource. We have not unearthed any global analysis of the magnitude and likely effects of this problem, although there are reports from select areas of the developed world that forest capacity is being severely stretched.

It is estimated that the industrialized countries possess 1.6 billion hectares of forest lands; 68% of this consists of coniferous trees and 32%

broadleafed. In this case, the resource yields mainly long wood fibre. In contrast, the developing countries are said to have 1.2 billion hectares, 93% broadleafed and only 7% coniferous; these resources yield therefore almost exclusively short wood fibre.

In the latter group, although much of its forest area is inaccessible or lacks the necessary infra-structure, a great deal of timber is available, especially in the form of tree plantations which offer considerable potential, given appropriate forest or plantation management. While the main problems in the developing countries are capital and markets for their pulp, the fast pace of pulp expansion could outpace their limited amount of accessible forest capacity.

In the industrialized countries where the productive capacity is extremely high, that capacity is already straining the accessible timber resource in many places.

It is reported that Sweden's forest capacity is being exceeded by its productive capacity of pulp, paper and paperboard. The Finnish situation is said to be roughly in balance. The U.S. report (SRI) speaks of "the tightening availability of timber supplies and their rapidly increasing costs" (saw log supplies are especially short).

Forests and productive capacities in Australia and New Zealand are reported to be roughly in balance. Japan has been a large net importer of wood fibre for a long time. In Part I, we noted authors who expected growing timber shortages in Canada in the near future, especially in eastern Canada.

Three major adjustment factors appear when productive capacity outpaces forest capacity. The price of timber goes up; the wood fibre is traded in greater volume from surplus to shortage areas; more wastepaper is recycled; product prices inflate more rapidly.

Some reports refer to the rapid rise in timber prices, but they do not provide information about how far these have exceeded the general inflation rate.

The wood fibre that has become such a large trading item comes in three forms: pulpwood and wood chips; woodpulp; and recycled fibre (wastepaper).

The main trade in pulpwood is centered in Europe and the U.S.S.R. is the major supplier, especially to Sweden and Finland. The trade in wood chips is said to have expanded significantly in recent years. It amounted to 11.5 million cubic meters in 1974: Japan took 90% of this with U.S. and Canada being the principal suppliers. Since then, according to Mr. Ecklund, Sweden has signed a five-year chip contract with the southern U.S. amounting to 2.4 million cubic meters. (The U.S. report, SRI, feels that the volume of chips sold to Sweden poses a threat to the future wood supply in the South.)

The domestic use of chips has expanded, in part because of the growing shortage of pulpwood. The U.S. report estimates that of the total wood fibre used, 35% comes from wood residue. The amount will vary a great deal; some firms have an integrated wood operation, others have not.

With steady improvement of technology, most of a tree is now being utilized, thus conserving timber.

Thanks to improved technology, recycled fibre is becoming increasingly important, according to reports. However, almost all the recycled paper and paperboard is processed and used in the densely populated areas where wastepaper is most plentiful.

Of course, the principal wood fibre trade continues to be woodpulp. Canada will no doubt remain the main supplier of long fibre market pulp, especially as the west European paper and paperboard capacities are outpacing their timber and pulp capacities. The main competition, as we noted earlier, will come from the emerging short fibre suppliers.

While shipping and packaging improvements have made chip transportation reasonably economical, the trading of this long fibre is not likely to expand significantly over the longer haul, unless transportation technology is able to transform inaccessible forests into accessible and economical ones.

It is reported (FAO) that the recycled fibre as a percentage of total fibre used may well increase in the future. It was estimated that in 1975 roughly 25% of total fibre constituted recycled fibre. This obviously helps to reduce the pressure on the virgin fibre. Nevertheless, despite the new technology which turns wastepaper into paper pellets, the amount shipped and traded is not expected to be high.

Two other items will help conserve wood fibre and so the timber resource. The U.S. report points out that recent analysis of trends in pulp furnish for different industrial grades of paper and paperboard, projects that the virgin woodpulp per ton of paper and paperboard production will decline significantly in the future.

Other reports observe the recent development of the lightweight newsprint which, while retaining the same surface measure, saves a great deal of wood fibre input. In other words, the newsprint tonnage declines, per given surface measure, without impairing quality.

Finally, when we consider forest capacity being strained as consumption of paper (and lumber) continues to expand, we are reminded that forest capacity is a flexible concept. Factors such as good husbandry, efficient forest management, appropriate reforestation and afforestation, introducing faster growing species, etc., all combine to augment forest capacity. On the other hand, factors such as forest fires, the spruce budworm, general forest neglect, setting aside forest reserves, etc., cause forest capacity to

shrink. Obviously, while bearing other things in mind, the country that emphasizes the positive factors while minimizing the effects of the negative ones comes closer to finding productive and forest capacities in balance.

The Industry and the Computer

Despite the high cost of money and of new equipment, sharply rising variable costs and keen competition internationally are pressuring firms to purchase increasingly more sophisticated hardware in order to achieve increased productivity and greater profitability. The ultimate road, according to one report (ICEF), is in the direction of the computer and automation.

The ICEF report reminds us that, possibly apart from the twinwire, the process of papermaking has remained basically the same since its inception. Successive advances in technology have been mainly directed at increasing the size and speed of the basic machine while also improving the ancillary operations.

Of more recent vintage is the introduction of self-regulating control and decision making via the computer. The availability of small computers makes it possible to control part of a process or one or more complete processes used in papermaking. So far no mill is fully automated; but it is only a matter of time, according to the report.

The purpose of introducing automatic controls is to reduce costs. Such controls can improve the quality of paper, reduce the amount of wood fibre used per ton of paper, save energy and displace labour. Instrument control can also keep the paper machine operating at optimum capacity by feeding into an automatic management information system.

The report provides three illustrations that demonstrate the level of sophistication of the new technology. The first is the recently completed

Varkaus Project in Finland, which is a totally integrated forest unit and is, possibly, the nearest to being fully automated.

Computer control is attached to almost all processes, from sorting logs to invoicing of client's orders. Logs are sorted automatically by species, size and quality and then debarked. Bark and other refuse unsuitable for pulp go to the thermal plant as fuel. Logs are then further sorted and directed to where they may be most profitably used (lumber mills or pulp). Secondary wood from the saw and plywood mills is converted into chips and pulped. Finally, all wood fibre, including sawdust, emerges as lumber, pulp or paper.

The IBM and Measurex computer systems are used with Honeywell controls and instrumentation to provide an integrated system, handling different types of data input simultaneously at three separate levels: process control, production control and cost/profit analysis.

The second example referred to is the St. Regis Paper Company in Maine, U.S.A., which has recently installed a new Beloit paper machine. The machine has a trim width of 7.1 meters and runs at a speed of 950 meters per minute. On-line computer monitoring is used.

The addition of the Beloit machine raises the mill capacity to 1,000 metric tons per day and makes it the world's largest for lightweight coated paper.

Winding, transporting, weighing, labelling, etc., are all automated.

The third example refers to a new machine control system, the 1180/micro, installed by the Scott Continental at its mill in Duffel, Belgium. The 1180/micro incorporates a Honeywell Level mini-computer and various micro computers developed by Industrial Nucleonics. The 1180/micro

is hooked on to a 3.55 meter wide tissue machine which makes a range of tissue grades. The system achieves moisture and weight control. Among the benefits cited is the reduction in weight variations amounting to 55%, improved fibre efficiency of 5%, paper machine efficiency of 2% and a reduction in energy consumed of 17%. This is rather impressive.

One of the few processes still depending on the traditional skilled workman is the refining process. However, considerable effort is going into automating this one as well.

Indubitably, despite the cost of these versatile gadgets, their ability to correct for weight, opacity, moisture, etc., and to monitor the machinery itself by predicting and forewarning what may be happening, makes their use profitable. The increasing sales of these systems testify to that. The ICEF report says that since the introduction of the 1180/micro system in the spring of 1977 (until early 1978) the company producing it claims to have procured 85 orders for use on a wide variety of machines.

Thus, the new sophisticated hardware is available. It is attractive to industry because it helps reduce input costs, reduce downtime which is so expensive, improve product quality and generally raise productivity.

Unfortunately, automation can and does produce drastic and even tragic human side effects by ruthlessly deskilling and displacing the workers with traditional operating skills. The more sudden and widespread the change-over, the more drastic the human consequences. While we do not foresee automation sweeping the Canadian pulp and paper industry like a windstorm, the computer systems are gaining momentum, pressured by competition.

Once the computer takes control of the processes of making pulp and paper, the traditional skills become obsolete. New skills are then required.

Experience from recent times suggests that when the advance in technology from one level to the next is radical enough to deskill the workforce, a certain strategy can be employed that will help minimize the human impact.

The first part of such a strategy is to devise a set of procedures and a program of action before the final decision is taken, for example, to computerize an operation.

The essential strategy procedure is to establish a management-trade union team that will jointly work out the details of the overall strategy and supervise its application. An initial strategy step is to establish ready access to appropriate retraining programs which can be quickly hooked into when the need arises; and to alert and utilize public services engaged in relocating workers who cannot be relocated within the enterprise.

Once the conversion has been decided upon, experts (under the direction of the "team") can be employed to carry out a manpower impact assessment study. It is from such findings that a particular strategy plan is developed. For example, the findings will suggest the magnitude and characteristics of the manpower impact, resulting from one or more operations being computerized. These findings will also provide the necessary data for establishing appropriate retraining and relocation programs.

As a matter of principle, the rate at which an employer introduces computers (or any other major technological change) should proceed at a pace which would allow the firm to absorb the workers potentially displaced by way of retraining, upgrading and attrition.

Should the employer want to accelerate that pace, some workers will be inevitably displaced from their jobs. When that occurs, the employer must be prepared to help cushion the income loss sustained by the affected workers.

In general, industry does not have a very proud record in this area. Over time, far too many workers, and their families, have suffered economically and socially in the relentless march to automation. It is unfortunately a traditional aspect of our system that while an employer feels responsible to the shareholders for improving the profitability of the enterprise, he is not made to feel an equal responsibility for the workers whom he has deprived of work and income in the process.

We believe the past procedure is not socially responsible, nor acceptable to us. We are of the view that when an employer upgrades his productive processes in order to become more profitable, he must be prepared to share the benefits derived with the workers who have lost their jobs. A worker so affected should have his income fully protected until he finds suitable employment with commensurate earnings.

We believe that the matter discussed above, the further likely penetration of the computer (and other worker-related shocks), and the inevitable human effects, especially as these pertain to workers and their families in remote industry towns, are a phase of industrial development that needs serious rethinking. Certainly, a more humane approach than now followed needs to be developed; a more equitable sharing arrangement must be found for those workers whose jobs and incomes are severed during the profitable advanced to automation.

All major technological changes require long-term planning. Such changes also require a careful analysis of how that change is going to affect the workforce. Once that is known, carefully designed adjustment programs must be prepared so as to maximize the number of workers retained; those deprived of their jobs must be given an income guarantee for a specific

period of time. The planning and implementation of these programs ought to be carried out jointly by the union and management, and with the assistance of the federal manpower and technological change agencies when so requested.

APPENDIX 1

Definitions

Forest Management (forest husbandry):

i) Generally, the practical application of scientific, economic and social principles to the administration of a forest estate for specific objectives.

ii) More particularly that branch of forestry concerned

a) with the overall administrative, economic, legal and social aspects, and

b) with the essentially scientific and technical aspects, especially silviculture, protection and forest regulation.

Silviculture:

i) Generally, the science and art of cultivating (i.e. growing and tending) forest crops based on a knowledge of silvics.

ii) More particularly the theory and practice of controlling the establishment, composition, constitution and growth of forests.

APPENDIX 2Firms and Organizations Engaged In
Research and Development

<u>Company or Organization</u>	<u>Location</u>	<u>No.</u>
Abitibi Paper Company Ltd.	Sheridan Park, Mississauga, Ontario	50
Canadian International Paper Company	Hawkesbury, Ontario	
Consolidated-Bathurst Ltd.	Grand'Mère, Quebec	
The Continental Group of Canada Ltd.	Toronto, Ontario	
Crown Zellerbach Canada Ltd.	Richmond, British Columbia	
Domtar Inc.	Senneville, Quebec	
Forest Engineering Research Institute	Pointe Claire, Quebec	
Fraser Companies, Limited	Edmundston, New Brunswick	
The Ontario Paper Company Ltd.	Thorold, Ontario	27
Ontario Research Foundation	Sheridan Park, Mississauga, Ont.	
The Price Company Limited	Kenogami, Quebec	
Pulp and Paper Research Institute of Canada and Canadian Pulp and Paper Association	Pointe Claire and Montreal	250

APPENDIX 3Examples of Major Technological Improvements
in the Pulp and Paper IndustryBy Canadian Pulp and Paper Firms:

Cowan screen
Magnefite pulping
Rotogravure newsprint
Offset newsprint
Tomlinson recovery boiler
Bel-Baie or Papriformer

By Foreign Equipment Suppliers:¹

Thermo-mechanical pulping
Kamyr continuous digester (and washer)
Synthetic paper machine fabric
Winder technology
High intensity presses
Oxygen bleaching

¹Canada was involved in one way or another in these and other improvements and inventions.

APPENDIX 4

<u>SELECT INDUSTRIES</u>	<u>AVERAGE WEEKLY EARNINGS Nov/78</u>	<u>AVERAGE HOURLY EARNINGS Nov/78</u>	
(Rank)			(Rank)
1. Iron Mining	\$ 426.28	\$ 9.99	2
2. Construction	412.38	10.66	1
3. Petroleum Refining	394.86	9.72	3
4. Mining and Milling	378.11	9.17	5
5. Motor Vehicles (assembly)	372.95	8.92	7
6. Pulp and Paper Mills	<u>371.31</u>	<u>9.27</u>	4
7. Industrial Chemicals	356.70	8.48	11
8. Boilers and Plate	354.29	8.93	6
9. Iron and Steel	344.04	8.59	9
10. Breweries	343.18	8.75	8
11. Coal Mining	339.72	8.25	14
12. Paper and Allied	<u>338.18</u>	<u>8.48</u>	10
13. Transportation Equipment	337.95	8.15	15
14. Smelting and Refining	335.87	8.36	12
15. Primary Metals Inds.	332.64	8.25	13
16. Saw,Shingle and Planing	312.97	8.15	16
17. Concrete Production	311.89	7.69	17
18. Tires and Tubes	311.19	7.53	20
19. Machinery Mnf.(ex electr)	303.16	7.59	18
20. Wood Products	292.36	7.59	19
Total Manufacturing Average	276.14		

Source: Statistics Canada Cat. 72-002 Dec.,1978

APPENDIX 5Labour - Management - Co-operation Committees/75

<u>Province</u>	<u>Committees</u>	<u>No. Workers</u>
Newfoundland	1	1,400
Nova Scotia	6	740
New Brunswick	7	2,168
Quebec	51	18,155
Ontario	67	23,835
Manitoba	5	680
Saskatchewan	2	495
Alberta	3	830
British Columbia	6	1,480
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	148	49,783

Labour Canada

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